DIGITAL MULTI VRF

Service Manual

GREE ELECTRIC APPLIANCES INC. OF ZHUHAI

CONTENTS

PRODUCT 2
1 MODELS LIST 2
1.1 Outdoor Unit 2
1.2 Indoor Unit 3
2 NOMENCLATURE 8
2.1 Nomenclature of Outdoor Unit 8
2.2 Nomenclature of Indoor Unit 9
3 FUNCTION 10
4 PRODUCT DATA 11
4.1 Product Data of Outdoor Unit 11
4.2 Product Data of Indoor Unit 16
5 PIPING DIAGRAM 38
CONTROL 49
1 OPERATION FLOWCHART 49
1.1 Cooling/Dehumidfying Operation 50
1.2 Heating Operation 51
2 MAIN LOGIC 52
2.1 Control Function of Outdoor Unit 52
2.2 Control Function of Indoor Unit 59
3 WIRELESS REMOTE CONTROLLER 68
4.1 Operation and Display View 71
4.2 Dimension 71
4.3 Installation 72
5 MINI CENTRALIZED CONTROLLER 73
5.1 Function 73
5.2 Operation View 75
5.3 Display View 76
5.4 Connection Between Controller and Unit 78
6 CENTRALIZED CONTROLLER 79
6.1 Function 79
6.2 Operation View 79
6.3 Display View 81
6.4 Connection Between Controller and Unit 82
6.5 Case Study 83
7 MONITORING SOFTWARE 96
7.1 Function 96
7.2 Connection Between the Computer and the Unit 96
7.3 Hardware 98
INSTALLATION 105
1 PRECAUTIONS FOR INSTALLATION 105
1.1 Precautions for Installation 105
2 FLOW CHART OF INSTALLATION 107

3.1 Hoisting of Unit 109
3.2 Selection of Installation Site 110
3.3 Dimensions Data 111
3.4 Installation Space Requirements 114
3.5 Take Monsoons and Snow into Consideration 118
4 INSTALLATION OF INDOOR UNIT 120
4.1 Duct Type 120
4.2 Cassette-type Unit 124
4.3 Floor Ceiling Type 132
5 INSTALLATION REQUIREMENTS OF REFRIGERANT PIPING 139
6 INSTALLATION OF REFRIGERANT PIPING 143
7 INSTALLATION OF ELECTRONIC EXPANSION VALVE PARTS 162
8 INSTALLATION OF CONDENSATE PIPE 164
8.1 Material Quality Requirements for Condensate Pipe 164
8.2 Key Points for Condensate Pipe Installation 164
8.3 Installation of Drainage Pipe for Different Types of Indoor Unit 164
8.4 Test for Condensate Pipe 172
8.5 Requirements of Heat Preservation 172
9 ELECTRICAL INSTALLATION 173
9.1 Precautions for Electrical Installation 173
9.2 Specifications of Power Cord & Circuit Breaker 174
9.3 Wiring Sketch Map 174
9.4 Dial-up of Unit 176
MAINTENANCE 181
1 TROUBLE TABLES 181
1.1 Trouble Display of Indoor Unit 181
1.2 Trouble and State Display of Mainboard LED of Outdoor Unit 183
1.3 Trouble Display of Outdoor Unit Transition Board 187
1.4 Trouble Display of Driver Board LED 189
2 FLOW CHART OF TROUBLESHOOTING 190
3 WIRING DIADRAM 197
4 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS 210
4.1Outdoor Unit 210
4.2 Indoor Unit 222
5 EXPLODED VIEWS AND PART LIST 230
5.1 Outdoor Unit 230
5.2 Exploded View of Indoor Unit and List of Component 244

PRODUCT

PRODUCT

1 MODELS LIST

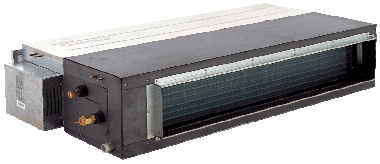
1.1 Outdoor Unit

Units Series	Model	Capacity		Ref	Power Supply	Appearance
		Cooling (Btu/h)	Heating (Btu/h)			
	GMV-R120W/Na-K	40946	47770	R410A	220V 50Hz	
	GMVL-R120W/Na-K		/			
	GMV-R160W/Na-M	54594	58006		380V 50Hz	
	GMVL-R160W/Na-M		/			
	GMV-R260W2/Na-M	88716	97246	R410A	380V 50Hz	
	GMVL-R260W2/Na-M		/			
	GMV-R300W2/Na-M	102360	114310			
	GMVL-R300W2/Na-M		/			
	GMV-R450W3/Na-M	153550	163780	R410A	380V 50Hz	
	GMVL-R450W3/Na-M		/			
	GMV-R560W4/Na-M	191080	204730	R410A	380V 50Hz	
	GMVL-R560W4/Na-M		/			
	GMV-R600W4/Na-M	204730	214960			
	GMVL-R600W4/Na-M		/			
	GMV-R860W6/Na-M	293440	307090	R410A	380V 50Hz	
	GMVL-R860W6/Na-M		/			
	GMV-R900W6/Na-M	327570	341210			
	GMVL-R900W6/Na-M		/			

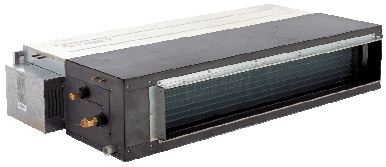
Conversion Formula: Btu/h=kW×3412

1.2 Indoor Unit

1.2.1 Duct type

Model	Capacity		Ref	Power Supply	Appearance
	Cooling (Btu/h)	Heating (Btu/h)			
GMV-R22P/Na-K	7507	8530	R410A	220V 50Hz	
GMVL-R22P/Na-K		/			
GMV-R25P/Na-K	8530	10236			
GMVL-R25P/Na-K		/			
GMV-R28P/Na-K	9554	10918			
GMVL-R28P/Na-K		/			
GMV-R32P/Na-K	10919	12283			
GMVL-R32P/Na-K		/			
GMV-R36P/Na-K	12284	13648			
GMVL-R36P/Na-K		/			
GMV-R40P/Na-K	13649	15354			
GMVL-R40P/Na-K		/			
GMV-R45P/Na-K	15355	17060			
GMVL-R45P/Na-K		/			
GMV-R50P/Na-K	17061	19790			
GMVL-R50P/Na-K		/			
GMV-R56P/Na-K	19108	21496			
GMVL-R56P/Na-K		/			
GMV-R63P/Na-K	21496	23884			
GMVL-R63P/Na-K		/			
GMV-R71P/Na-K	24226	27296			
GMVL-R71P/Na-K		/			
GMV-R80P/Na-K	27297	30026			
GMVL-R80P/Na-K		/			
GMV-R90P/Na-K	30709	34120			
GMVL-R90P/Na-K		/			
GMV-R100P/Na-K	34121	37532			
GMVL-R100P/Na-K		/			
GMV-R112P/Na-K	38216	42650			
GMVL-R112P/Na-K		/			
GMV-R125P/Na-K	42652	46060			
GMVL-R125P/Na-K		/			
GMV-R140P/Na-K	47770	51180			
GMVL-R140P/Na-K		/			
~~GMV-R224P/Na-M~~	~~76432~~	~~85304~~		~~380V 50Hz~~	
~~GMVL-R224P/Na-M~~		~~/~~			
~~GMV-R280P/Na-M~~	~~95540~~	~~105780~~			
~~GMVL-R280P/Na-M~~		~~/~~			

Conversion Formula: Btu/h=kW×3412

Model	Capacity		Ref	Power Supply	Appearance
	Cooling (Btu/h)	Heating (Btu/h)			
GMV-R22P/NaB-K	7507	8530	R410A	220-240V ~50Hz	
GMVL-R22P/NaB-K		/			
GMV-R25P/NaB-K	8530	10236			
GMVL-R25P/NaB-K		/			
GMV-R28P/NaB-K	9554	10918			
GMVL-R28P/NaB-K		/			
GMV-R36P/NaB-K	12284	13648			
GMVL-R36P/NaB-K		/			
GMV-R45P/NaB-K	15355	17060			
GMVL-R45P/NaB-K		/			
GMV-R56P/NaB-K	19108	21496			
GMVL-R56P/NaB-K		/			
GMV-R71P/NaB-K	24226	27296			
GMVL-R71P/NaB-K		/			
GMV-R90P/NaB-K	30709	34120			
GMVL-R90P/NaB-K		/			
GMV-R112P/NaB-K	38216	42650			
GMVL-R112P/NaB-K		/			
GMV-R140P/NaB-K	47770	51180			
GMVL-R140P/NaB-K		/			

Conversion Formula: Btu/h=kW×3412

1.2.2 Cassette type

Model	Capacity		Ref	Power Supply	Appearance
	Cooling (Btu/h)	Heating (Btu/h)			
GMV-R28T/Na-K	9550	10900	R410A	220V 50Hz	
GMVL-R28T/Na-K		/			
GMV-R36T/Na-K	12280	13650			
GMVL-R36T/Na-K		/			
GMV-R45T/Na-K	15360	17060			
GMVL-R45T/Na-K		/			
GMV-R50T/Na-K	17060	19790			
GMVL-R50T/Na-K		/			
GMV-R56T/Na-K	19100	21500			
GMVL-R56T/Na-K		/			
GMV-R71T/Na-K	24230	27300			
GMVL-R71T/Na-K		/			
GMV-R90T/Na-K	30700	34120			
GMVL-R90T/Na-K		/			

GMV-R112T/Na-K	38210	42650			
GMVL-R112T/Na-K		/			
GMV-R125T/Na-K	42650	46062			
GMVL-R125T/Na-K		/			
GMV-R140T/Na-K	47770	49470			
GMVL-R140T/Na-K		/			

Conversion Formula: Btu/h=kW×3412

1.2.3 Wall mounted type

Model	Capacity		Ref	Power Supply	Appearance
	Cooling (Btu/h)	Heating (Btu/h)			
GMV-R22G/NaB-K	7507	8530	R410A	220V 50Hz	
GMVL-R22G/NaB-K		/			
GMV-R28G/NaB-K	9554	10919			
GMVL-R28G/NaB-K		/			
GMV-R36G/NaB-K	12284	13649			
GMVL-R36G/NaB-K		/			
GMV-R45G/NaB-K	15355	17061			
GMVL-R45G/NaB-K		/			
GMV-R50G/NaB-K	17061	19790			
GMVL-R50G/NaB-K		/			
GMV-R56G/NaB-K	19108	21496			
GMVL-R56G/NaB-K		/			
GMV-R22G/NaC-K	7507	8530			
GMVL-R22G/NaC-K		/			
GMV-R28G/NaC-K	9554	10919			
GMVL-R28G/NaC-K		/			
GMV-R36G/NaC-K	12284	13649			
GMVL-R36G/NaC-K		/			
GMV-R45G/NaC-K	15355	17061			
GMVL-R45G/NaC-K		/			
GMV-R71G/Na-K	24226	27297			
GMVL-R71G/Na-K		/			
GMV-R80G/Na-K	27297	30709			
GMVL-R80G/Na-K		/			

Note: Btu/h=kW×3412

1.2.4Floor ceiling type

Model	Capacity		Ref	Power Supply	Appearance
	Cooling (Btu/h)	Heating (Btu/h)			
GMV-R28Zd/Na-K	9554	10919	R410A	220V 50Hz	
GMVL-R28Zd/Na-K		/			
GMV-R36Zd/Na-K	12284	13649			
GMVL-R36Zd/Na-K		/			
GMV-R50Zd/Na-K	17061	19790			
GMVL-R50Zd/Na-K		/			
GMV-R71Zd/Na-K	24226	27297			
GMVL-R71Zd/Na-K		/			
GMV-R90Zd/Na-K	30709	34121			
GMVL-R90Zd/Na-K		/			
GMV-R112Zd/Na-K	38216	42652			
GMVL-R112Zd/Na-K		/			
GMV-R125Zd/Na-K	42652	46064			
GMVL-R125Zd/Na-K		/			

Note: Btu/h=kW×3412

Notes: a. Cooling only unit (GMVL type) has no items on heating;

b. Noise was tested in semi-silenced room, so the actual noise value will be a little higher for change of ambient;

c. Nominal capacities are based on the following conditions:

Cooling	Heating
Indoor :27℃(80.6℉)/19℃(66.2℉)	Indoor: 20℃(68℉)/-
Outdoor: 35℃(95℉)/-	Outdoor : 7℃(44.6℉)/6℃(42.8℉)

2 NOMENCLATURE

2.1 Nomenclature of Outdoor Unit

GMV	□	-	R	□	W	*	/	Na	-	□
1	2		3	4	5	6		7		8

NO.	Description	Options
1	GREE multi variable	
2	Model Code	L: Cooling Only Default: Heat pump
3	Digital scroll	
4	Nominal cooling capacity	120:12KW 160:16KW 260:26KW 300:30KW 450:45KW 560:56KW 600:60KW 860:86KW 900:90KW
5	Outdoor unit	
6	Compressor quantity	
7	Refrigerant: R410A	
8	Power complement	M: 380V, 3N~, 50 Hz K :220V~, 50Hz

Example: GMV-R300W2/Na-M, a digital scroll outdoor unit of GREE using R410A refrigerant, with two compressors and the nominal cooling capacity is 30kw. The power supply is 380V,3N~,50 Hz.

2.2 Nomenclature of Indoor Unit

GMV	□	-	R	□	□	/	Na	□	-	□
1	2		3	4	5		6	7		8

NO.	Description	Options
1	GREE multi variable	
2	Model Code	L: Cooling Only Default: Heat pump
3	Digital scroll	
4	Nominal cooling capacity	22:2.2KW 25:2.5KW 28:2.8KW 32:3.2KW 36:3.6KW 40:4.0KW 45:4.5KW 50:5.0KW 56:5.6KW 63:6.3KW 71:7.1KW 80:8.0KW 90:9.0KW 100:10KW 112:11.2KW 125:12.5KW 140:14.0KW
5	Indoor unit	G: wall mounted P: ducted T: cassette Zd: floor ceiling
6	Refrigerant: R410A	
7	Design Sequence.	B :Second generation
8	Power complement	M: 380V, 3N~, 50 Hz K :220V~, 50Hz

Example: GMV-R22G/NaB-K. A wall mounted indoor unit of GREE, and the nominal cooling capacity is 2.2kw. It's the second generation product, and it could connect the outdoor unit with digital scroll the power supply is 220V~, 50Hz.

3 FUNCTION

For Comfortable Air Conditioning	Auto Restart
	Fan Operation Mode
	LCD Remote Controller (Option)
	Auto Swing Function
	Ceiling Soiling Prevention
	Program Dry
	High Fan Speed Mode
	High Ceiling Application
	Two Select Thermo Sensor
	Hot Start
	Timer Selector
For Easy Construction and Maintenance	Fresh Air Intake Directly from The Unit
	Drain Pump
	Long Life Filter
	Ultra-Long life Filter (Option)
	Mold Resistant Treatment for Filter
	Filter Sign
	Mold Resistant Drain Pan
	Emergency Operation
	Self Diagnoses Function
For Flexible Control	Set Back Time Clock
	Double Remote Control
	Group Control By 1 Remote Controller
	Control By External Command
	Remote/Centralized Control

4 PRODUCT DATA

4.1 Product Data of Outdoor Unit

Model			GMV(L)-R120W/Na-K	GMV(L)-R160W/Na-M
Capacity	Cooling①	kW	12	16
		Btu/h	40946	54594
	Heating②	kW	14	17
		Btu/h	47770	58006
Noise		dB(A)	58	58
R410A Filling Amount		kg	6	8
Power Supply		V,Ph,Hz	220-240V ~ 50Hz	380-415V 3N~ 50Hz
Power input	Cooling	kW	3.9	4.9
	Heating	kW	3.8	4.8
Rated current	Cooling	A	21.1	7.8
	Heating	A	21.9	8.1
Dimensions	Width	mm	1100	1100
	Depth	mm	340	340
	Height	mm	1250	1250
Compressor			Digital Scroll×1	Digital Scroll×1
Moisture protection			IP24	IP24
Climate Type			T1	T1
Connection Pipes	Gas Pipe	mm	Φ15.9	Φ19.05
		Inch	5/8	3/4
	Liquid Pipe	mm	Φ9.52	Φ9.52
		Inch	3/8	3/8
	Connection Method		Flare Connection	Flare Connection
	Max. NO. of Indoor Unit		5	7
Fan	Power input	kW	0.42	0.42
	Air Flow Rate	m3/h	6000	6000
		CFM	3531	3531
	Step		2	2
Weight(Net/Gross)		kg	140/160	140/160
Recommended Power Lines	mm2×No.		6.0×3	2.5×5
Dimensions of Installation		mm	(590+201)×378	(590+201)×378
Dimensions of Package	Width	mm	1260	1260
	Depth	mm	450	450
	Height	mm	1270	1270
Loading Quantity (20’ Container) ③		unit	21	21
Loading Quantity (40’ Container) ④		unit	46	46
Loading Quantity (40’ High Cube Container) ⑤		unit	92	92
Circuit breaker		A	32	16

Model			GMV(L)-R260W2/Na-M	GMV(L)-R300W2/Na-M
Capacity	Cooling①	kW	26	30
		Btu/h	88716	102360
	Heating②	kW	28.5	33.5
		Btu/h	97246	114310
Noise		dB(A)	58	58
R410A Filling Amount		kg	14	14
Power Supply		V,Ph,Hz	380-415V 3N~ 50Hz	380-415V 3N~ 50Hz
Power input	Cooling	kW	8.5	9.0
	Heating	kW	8.0	8.8
Rated current	Cooling	A	17.5	18.2
	Heating	A	18.2	18.6
Dimensions	Width	mm	990	990
	Depth	mm	880	880
	Height	mm	1772	1772
Compressor			Digital Scroll×1 + Constant Speed Scroll×1	Digital Scroll×1 + Constant Speed Scroll×1
Moisture protection			IP24	IP24
Climate Type			T1	T1
Connection Pipes	Gas Pipe	mm	Φ22.2	Φ22.2
		Inch	7/8	7/8
	Liquid Pipe	mm	Φ9.52	Φ9.52
		Inch	3/8	3/8
	Connection Method		Brazing Connection	Flare Connection
	Max. NO. of Indoor Unit		12	14
Fan	Power input	kW	1	1
	Air Flow Rate	m3/h	10000	10000
		CFM	5886	5886
	Step		12	12
Weight(Net/Gross)		kg	280/310	300/330
Recommended Power Lines	mm2×Number		6.0×5	6.0×5
Dimensions of Installation		mm	787(337)×844	787(337)×844
Dimensions of Package	Width	mm	1162	1162
	Depth	mm	980	980
	Height	mm	1950	1950
Loading Quantity (20’ Container) ③		unit	10	10
Loading Quantity (40’ Container) ④		unit	22	22
Loading Quantity (40’ High Cube Container) ⑤		unit	22	22
Circuit breaker		A	32	32

Model			GMV(L)-R450W3/Na-M	GMV(L)-R560W4/Na-M
Capacity	Cooling①	kW	45	56
		Btu/h	153550	191080
	Heating②	kW	48	60
		Btu/h	163780	204730
Noise		dB(A)	60	60
R410A Filling Amount		kg	20	25
Power Supply		V,Ph,Hz	380-415V 3N~ 50Hz	380-415V 3N~ 50Hz
Power input	Cooling	kW	14.5	18.5
	Heating	kW	13.7	18.0
Rated current	Cooling	A	27.1	34.7
	Heating	A	27.5	34.8
Dimensions	Width	mm	1290	1980
	Depth	mm	880	920
	Height	mm	1772	1760
Compressor			Digital Scroll×1 + Constant Speed Scroll×2	Digital Scroll×1 + Constant Speed Scroll×3
Moisture protection			IP24	IP24
Climate Type			T1	T1
Connection Pipes	Gas Pipe	mm	Φ28.6	Φ28.6
		Inch	1-1/8	1-1/8
	Liquid Pipe	mm	Φ12.7	Φ15.9
		Inch	1/2	5/8
	Connection Method		Flare Connection	Brazing Connection
	Max. NO. of Indoor Unit		16	25
Fan	Power input	kW	1	2
	Air Flow Rate	m3/h	10000	20000
		CFM	5886	11771
	Step		12	12
Weight(Net/Gross)		kg	450/490	600/640
Recommended Power Lines	mm2×Number		10.0×5	16.0×5
Dimensions of Installation		mm	1160(850) ×844	(1400±2) (460±2) ×(880±2)
Dimensions of Package	Width	mm	1370	2152
	Depth	mm	980	980
	Height	mm	1950	1950
Loading Quantity (20’ Container) ③		unit	8	5
Loading Quantity (40’ Container) ④		unit	17	12
Loading Quantity (40’ High Cube Container) ⑤		unit	17	12
Circuit breaker		A	40	50

Model			GMV(L)-R600W4/Na-M	GMV(L)-R860W6/Na-M
Capacity	Cooling①	kW	60	86
		Btu/h	204730	293440
	Heating②	kW	63	96
		Btu/h	214960	307090
Noise		dB(A)	60	62
R410A Filling Amount		kg	25	45
Power Supply		V,Ph,Hz	380-415V 3N~ 50Hz	380-415V 3N~ 50Hz
Power input	Cooling	kW	19.2	28.8
	Heating	kW	18.2	26.4
Rated current	Cooling	A	36	50.6
	Heating	A	36	46.6
Dimensions	Width	mm	1980	2580
	Depth	mm	920	880
	Height	mm	1760	1772
Compressor			Digital Scroll×1 + Constant Speed Scroll×3	Digital Scroll×1 + Constant Speed Scroll×5
Moisture protection			IP24	IP24
Climate Type			T1	T1
Connection Pipes	Gas Pipe	mm	Φ28.6	Φ34.9
		Inch	1-1/8	1-3/8
	Liquid Pipe	mm	Φ15.9	Φ19.05
		Inch	5/8	3/4
	Connection Method		Brazing Connection	Brazing Connection
	Max. NO. of Indoor Unit		27	32
Fan	Power input	kW	2	2
	Air Flow Rate	m3/h	20000	20000
		CFM	11771	11771
	Step		12	12
Weight(Net/Gross)		kg	600/640	800/850
Recommended Power Lines	mm2×Number		16.0×5	35.0×5
Dimensions of Installation		mm	(1400±2) (460±2) ×(880±2)	(2000±2) (860±2) ×(844±2)
Dimensions of Package	Width	mm	2152	2660
	Depth	mm	980	980
	Height	mm	1950	1950
Loading Quantity (20’ Container) ③		unit	5	/
Loading Quantity (40’ Container) ④		unit	12	/
Loading Quantity (40’ High Cube Container) ⑤		unit	12	/
Circuit breaker		A	50	80

Model			GMV(L)-R900W6/Na-M
Capacity	Cooling①	kW	90
		Btu/h	327570
	Heating②	kW	100
		Btu/h	341210
Noise		dB(A)	62
R410A Filling Amount		kg	45
Power Supply		V,Ph,Hz	380-415V 3N~ 50Hz
Power input	Cooling	kW	30.1
	Heating	kW	27.5
Rated current	Cooling	A	52.9
	Heating	A	48.5
Dimensions	Width	mm	2580
	Depth	mm	880
	Height	mm	1772
Compressor			Digital Scroll×1+ Constant Speed Scroll×5
Moisture protection			IP24
Climate Type			T1
Connection Pipes	Gas Pipe	mm	Φ34.9
		Inch	1-3/8
	Liquid Pipe	mm	Φ19.05
		Inch	3/4
	Connection Method		Brazing Connection
	Max. NO. of Indoor Unit		32
Fan	Power input	kW	2
	Air Flow Rate	m3/h	24000
		CFM	11771
	Step		12
Weight(Net/Gross)		kg	800/850
Recommended Power Lines	mm2×Number		35.0×5
Dimensions of Installation		mm	(2000±2) (860±2) ×(844±2)
Dimensions of Package	Width	mm	2660
	Depth	mm	980
	Height	mm	1950
Loading Quantity (20’ Container) ③		unit	/
Loading Quantity (40’ Container) ④		unit	/
Loading Quantity (40’ High Cube Container) ⑤		unit	/
Circuit breaker		A	80

① Indoor air temperature: 27℃(80.6℉)/19℃(66.2℉) Outdoor air temperature: 35℃(95℉)/-;

② Indoor air temperature: 20℃(68℉)/- Outdoor air temperature: 7℃(44.6℉)/6℃(42.8℉);

③ Interior Dimensions L*W*H: 5898*2352*2393, Door Opening W*H: 2343*2280;

④ Interior Dimensions L*W*H: 12032*2350*2390, Door Opening W*H: 2343*2280;

⑤ Interior Dimensions L*W*H:12032*2350*2697, Door Opening W*H: 2338*2585.

4.2 Product Data of Indoor Unit

4.2.1 Duct Type

Model			GMV(L)-R22P/Na-K	GMV(L)-R25P/Na-K	GMV(L)-R28P/Na-K
Cooling Capacity		kW	2.2	2.5	2.8
		Btu	7506	8530	9554
Heating Capacity		kW	2.5	3.0	3.2
		Btu	8530	10236	10918
Air Flow Rate		m3/h	450	450	570
		CFM	265	265	336
Sound Pressure Level (H/L)		dB(A)	37/33	37/33	39/35
External Static Pressure		Pa	25	25	25
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.02	0.02	0.02
	Running Current	A	0.17	0.17	0.16
Connecting Pipes	Gas Pipe	mm	φ9.52	φ9.52	φ9.52
		inch	φ3/8 "	φ3/8 "	φ3/8 "
	Liquid Pipe	mm	φ6.35	φ6.35	φ6.35
		inch	φ1/4 "	φ1/4 "	φ1/4 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ20×1.5	φ20×1.5	φ20×1.5
Unit Dimensions(W×D×H)		mm	875×680×220	875×680×220	875×680×220
Package Dimensions (W×D×H)		mm	1012×708×275	1012×708×275	1012×708×275
Weight（Net/Gross）		kg	27/31	27/31	27/31

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R32P/Na-K	GMV(L)-R36P/Na-K	GMV(L)-R40P/Na-K
Cooling Capacity		kW	3.2	3.6	4.0
		Btu	10919	12284	13649
Heating Capacity		kW	3.6	4.0	4.5
		Btu	12283	13648	15354
Air Flow Rate		m3/h	570	570	840
		CFM	336	336	494
Sound Pressure Level (H/L)		dB(A)	39/35	39/35	40/36
External Static Pressure		Pa	25	25	20
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.02	0.02	0.07
	Running Current	A	0.16	0.16	0.69
Connecting Pipes	Gas Pipe	mm	φ12.7	φ12.7	φ12.7
		inch	φ1/2 "	φ1/2 "	φ1/2 "
	Liquid Pipe	mm	φ6.35	φ6.35	φ6.35
		inch	φ1/4 "	φ1/4 "	φ1/4 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ20×1.5	φ20×1.5	φ30×1.5
Unit Dimensions(W×D×H)		mm	875×680×220	875×680×220	980×736×266
Package Dimensions (W×D×H)		mm	1012×708×275	1012×708×275	1068×766×320
Weight（Net/Gross）		kg	27/31	27/31	36/39

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R45P/Na-K	GMV(L)-R50P/Na-K	GMV(L)-R56P/Na-K
Cooling Capacity		kW	4.5	5.0	5.6
		Btu	15355	17061	19108
Heating Capacity		kW	5.0	5.8	6.3
		Btu	17060	19790	21496
Air Flow Rate		m3/h	840	840	1400
		CFM	494	494	824
Sound Pressure Level (H/L)		dB(A)	40/36	40/36	42/38
External Static Pressure		Pa	40	40	100
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.07	0.07	0.15
	Running Current	A	0.69	0.69	1.32
Connecting Pipes	Gas Pipe	mm	φ12.7	φ12.7	φ15.9
		inch	φ1/2 "	φ1/2 "	φ5/8 "
	Liquid Pipe	mm	φ6.35	φ6.35	φ9.52
		inch	φ1/4 "	φ1/4 "	φ3/8 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ30×1.5	φ30×1.5	φ30×1.5
Unit Dimensions(W×D×H)		mm	980×736×266	980×736×266	1112×756×300
Package Dimensions (W×D×H)		mm	1068×766×320	1068×766×320	1245×785×360
Weight（Net/Gross）		kg	36/39	36/39	55/59

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R63P/Na-K	GMV(L)-R71P/Na-K	GMV(L)-R80P/Na-K
Cooling Capacity		kW	6.3	7.1	8.0
		Btu	21496	24226	27297
Heating Capacity		kW	7.0	8.0	8.8
		Btu	23884	27296	30026
Air Flow Rate		m3/h	1400	1400	1400
		CFM	824	824	824
Sound Pressure Level (H/L)		dB(A)	42/38	42/38	42/38
External Static Pressure		Pa	100	100	100
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.15	0.15	0.15
	Running Current	A	1.32	1.32	1.32
Connecting Pipes	Gas Pipe	mm	φ15.9	φ15.9	φ15.9
		inch	φ5/8 "	φ5/8 "	φ5/8 "
	Liquid Pipe	mm	φ9.52	φ9.52	φ9.52
		inch	φ3/8 "	φ3/8 "	φ3/8 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ30×1.5	φ30×1.5	φ30×1.5
Unit Dimensions(W×D×H)		mm	1112×756×300	1112×756×300	1112×756×300
Package Dimensions (W×D×H)		mm	1245×785×360	1245×785×360	1245×785×360
Weight（Net/Gross）		kg	55/59	55/59	55/59

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R90P/Na-K	GMV(L)-R100P/Na-K	GMV(L)-R112P/Na-K
Cooling Capacity		kW	9.0	10.0	11.2
		Btu	30709	34121	38216
Heating Capacity		kW	10.0	11.0	12.5
		Btu	34120	37532	42650
Air Flow Rate		m3/h	2000	2000	2000
		CFM	1177	1177	1177
Sound Pressure Level (H/L)		dB(A)	44/40	44/40	44/40
External Static Pressure		Pa	100	100	100
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.225	0.225	0.225
	Running Current	A	2.14	2.14	2.14
Connecting Pipes	Gas Pipe	mm	φ15.9	φ15.9	φ15.9
		inch	φ5/8 "	φ5/8 "	φ5/8 "
	Liquid Pipe	mm	φ9.52	φ9.52	φ9.52
		inch	φ3/8 "	φ3/8 "	φ3/8 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ30×1.5	φ30×1.5	φ30×1.5
Unit Dimensions(W×D×H)		mm	1385×736×300	1385×736×300	1385×736×300
Package Dimensions (W×D×H)		mm	1514×795×360	1514×795×360	1514×795×360
Weight（Net/Gross）		kg	75/79	75/79	75/79

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R125P/Na-K	GMV(L)-R140P/Na-K
Cooling Capacity		kW	12.5	14.0
		Btu	42652	47770
Heating Capacity		kW	13.5	15.0
		Btu	46060	51180
Air Flow Rate		m3/h	2000	2000
		CFM	1177	1177
Sound Pressure Level (H/L)		dB(A)	44/40	45/41
External Static Pressure		Pa	100	50
Power Supply			220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.225	0.225
	Running Current	A	2.14	2.14
Connecting Pipes	Gas Pipe	mm	φ15.9	φ15.9
		inch	φ5/8 "	φ5/8 "
	Liquid Pipe	mm	φ9.52	φ9.52
		inch	φ3/8 "	φ3/8 "
	Connection Method		Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ30×1.5	φ30×1.5
Unit Dimensions(W×D×H)		mm	1385×736×300	1385×736×300
Package Dimensions (W×D×H)		mm	1514×795×360	1514×795×360
Weight（Net/Gross）		kg	75/79	75/79

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R22P/NaB-K	GMV(L)-R25P/NaB-K
Cooling Capacity		kW	2.2	2.5
		Btu	7507	8530
Heating Capacity		kW	2.5	3.0
		Btu	8530	10236
Air Flow Rate		m3/h	450	450
		CFM	265	265
Sound Pressure Level (H/L)		dB(A)	37/33	37/33
External Static Pressure		Pa	20	20
Power Supply			220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.075	0.075
	Running Current	A	0.30	0.30
Connecting Pipes	Gas Pipe	mm	φ9.52	φ9.52
		inch	φ3/8 "	φ3/8 "
	Liquid Pipe	mm	φ6.35	φ6.35
		inch	φ1/4 "	φ1/4 "
	Connection Method		Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ20×1.5	φ20×1.5
Unit Dimensions(W×D×H)		mm	875×680×220	875×680×220
Package Dimensions (W×D×H)		mm	1012×708×275	1012×708×275
Weight（Net/Gross）		kg	27/31	27/31

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R28P/NaB-K	GMV(L)-R32P/NaB-K	GMV(L)-R36P/NaB-K
Cooling Capacity		kW	2.8	3.2	3.6
		Btu	9554	10919	12284
Heating Capacity		kW	3.2	3.6	4.0
		Btu	10918	12283	13648
Air Flow Rate		m3/h	570	570	570
		CFM	336	336	336
Sound Pressure Level (H/L)		dB(A)	39/35	39/35	39/35
External Static Pressure		Pa	20	20	20
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.08	0.08	0.08
	Running Current	A	0.40	0.40	0.40
Connecting Pipes	Gas Pipe	mm	φ9.52	φ12.7	φ12.7
		inch	φ3/8 "	φ1/2 "	φ1/2 "
	Liquid Pipe	mm	φ6.35	φ6.35	φ6.35
		inch	φ1/4 "	φ1/4 "	φ1/4 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ20×1.5	φ20×1.5	φ20×1.5
Unit Dimensions(W×D×H)		mm	875×680×220	875×680×220	875×680×220
Package Dimensions (W×D×H)		mm	1012×708×275	1012×708×275	1012×708×275
Weight（Net/Gross）		kg	27/31	27/31	27/31

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R45P/NaB-K	GMV(L)-R56P/NaB-K	GMV(L)-R71P/NaB-K
Cooling Capacity		kW	4.5	5.6	7.1
		Btu	15355	19108	24226
Heating Capacity		kW	5.0	6.3	8.0
		Btu	17060	21496	27296
Air Flow Rate		m3/h	840	1400	1400
		CFM	494	824	824
Sound Pressure Level (H/L)		dB(A)	40/36	42/38	42/38
External Static Pressure		Pa	50/20	60/30	60/30
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.14	0.24	0.24
	Running Current	A	0.60	1.00	1.00
Connecting Pipes	Gas Pipe	mm	φ12.7	Φ15.9	Φ15.9
		inch	1/2 "	5/8 "	5/8 "
	Liquid Pipe	mm	φ6.35	Φ9.52	Φ9.52
		inch	1/4 "	3/8 "	3/8 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ30×1.5	Φ30×1.5	Φ30×1.5
Unit Dimensions (W×D×H)		mm	980×736×266	1112×756×300	1112×756×300
Package Dimensions (W×D×H)		mm	1068×766×320	1245×785×360	1245×785×360
Weight（Net/Gross）		kg	34/37	49/56	49/56

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R90P/NaB-K	GMV(L)-R112P/NaB-K	GMV(L)-R140P/NaB-K
Cooling Capacity		kW	9.0	11.2	14.0
		Btu	30709	38216	47770
Heating Capacity		kW	10.0	12.5	15.0
		Btu	34120	42650	51180
Air Flow Rate		m3/h	2000	2000	2500
		CFM	1177	1177	1471
Sound Pressure Level (H/L)		dB(A)	44/40	44/40	45/41
External Static Pressure		Pa	80/40	80/40	100/50
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.36	0.36	0.50
	Running Current	A	1.60	1.60	2.00
Connecting Pipes	Gas Pipe	mm	Φ15.9	Φ15.9	Φ15.9
		inch	5/8 "	5/8 "	5/8 "
	Liquid Pipe	mm	Φ9.52	Φ9.52	Φ9.52
		inch	3/8 "	3/8 "	3/8 "
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ30×1.5	Φ30×1.5	Φ30×1.5
Unit Dimensions (W×D×H)		mm	1425×756×300	1425×756×300	1463×756×300
Package Dimensions (W×D×H)		mm	1514×785×360	1514×785×360	1555×810×345
Weight（Net/Gross）		kg	62/71	62/71	63.5/73

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

4.2.2Cassete Type

Model			GMV(L)-R28T/Na-K	GMV(L)-R36T/Na-K	GMV(L)-R45T/Na-K
Cooling Capacity		kW	2.8	3.6	4.5
		Btu	9550	12280	15360
Heating Capacity		kW	3.2	4.0	5.0
		Btu	10900	13650	17060
Air Flow Rate		m3/h	680	680	680
		CFM	400	400	400
Sound Pressure Level (H/L)		dB(A)	37/34	37/34	37/34
External Static Pressure		Pa			
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.035	0.035	0.035
	Running Current	A	0.19	0.19	0.28
Connecting Pipes	Gas Pipe	mm	Φ9.52	Φ12.7	Φ12.7
		inch	Φ3/8	Φ1/2	Φ1/2
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35
		inch	Φ1/4	Φ1/4	Φ1/4
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ30×1.5	Φ30×1.5	Φ30×1.5
Unit Dimensions(W×D×H)		mm	840×840×190	840×840×190	840×840×190
Package Dimensions (W×D×H)		mm	950×950×60	950×950×60	950×950×60
Weight（Net/Gross）		kg	25/31.5	25/31.5	25/31.5

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R50T/Na-K	GMV(L)-R56T/Na-K	GMV(L)-R71T/Na-K
Cooling Capacity		kW	5.0	5.6	7.1
		Btu	17060	19100	24230
Heating Capacity		kW	5.8	6.3	8.0
		Btu	19790	21500	27300
Air Flow Rate		m3/h	680	1180	1180
		CFM	400	695	695
Sound Pressure Level (H/L)		dB(A)	37/34	39/35	39/35
External Static Pressure		Pa			
Power Supply			220-240V～50Hz	220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.035	0.035	0.035
	Running Current	A	0.28	0.28	0.28
Connecting Pipes	Gas Pipe	mm	Φ12.7	Φ15.9	Φ15.9
		inch	Φ1/2	Φ5/8	Φ5/8
	Liquid Pipe	mm	Φ6.35	Φ9.52	Φ9.52
		inch	Φ1/4	Φ3/8	Φ3/8
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ30×1.5	Φ30×1.5	Φ30×1.5
Unit Dimensions(W×D×H)		mm	840×840×190	840×840×240	840×840×240
Package Dimensions (W×D×H)		mm	950×950×60	950×950×60	950×950×60
Weight（Net/Gross）		kg	25/31.5	30/36.5	30/36.5

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R90T/Na-K	GMV(L)-R112T/Na-K
Cooling Capacity		kW	9.0	11.2
		Btu	30700	38210
Heating Capacity		kW	10.0	12.5
		Btu	34120	42650
Air Flow Rate		m3/h	1860	1860
		CFM	1095	1095
Sound Pressure Level (H/L)		dB(A)	40/36	40/36
External Static Pressure		Pa		
Power Supply			220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.06	0.06
	Running Current	A	0.59	0.59
Connecting Pipes	Gas Pipe	mm	Φ15.9	Φ15.9
		inch	Φ5/8	Φ5/8
	Liquid Pipe	mm	Φ9.52	Φ9.52
		inch	Φ3/8	Φ3/8
	Connection Method		Flare Connection	Flare Connection
Drain Pipes（External Dia. × Thickness）		mm	Φ30×1.5	Φ30×1.5
Unit Dimensions(W×D×H)		mm	840×840×320	840×840×320
Package Dimensions(W×D×H)		mm	950×950×60	950×950×60
Weight（Net/Gross）		kg	38/44.5	38/44.5

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R125T/Na-K	GMV(L)-R140T/Na-K
Cooling Capacity		kW	12.5	14.0
		Btu	42650	47770
Heating Capacity		kW	13.5	14.5
		Btu	46062	49470
Air Flow Rate		m3/h	1860	1860
		CFM	1095	1095
Sound Pressure Level (H/L)		dB(A)	40/36	40/36
External Static Pressure		Pa	0	0
Power Supply			220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.06	0.06
	Running Current	A	0.59	0.59
Connecting Pipes	Gas Pipe	mm	Φ15.9	Φ15.9
		inch	5/8 "	5/8 "
	Liquid Pipe	mm	Φ9.52	Φ9.52
		inch	3/8 "	3/8 "
	Connection Method		Flare Connection	Flare Connection
Drain Pipes (External Dia. × Thickness)		mm	Φ30×1.5	Φ30×1.5
Unit Dimensions (W×D×H)		mm	Main body：840×840×320 Panel：950×950×60	
Package Dimensions (W×D×H)		mm	Main body：960×960×394 Panel：1040×1025×115	
Net Weight (Main body/Panel)		kg	38/6.5	
Gross Weight (Main body/Panel)		kg	46/10	

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

4.2.3Wall mounted Type

Model			GMV(L)-R22G/NaB-K	GMV(L)-R28G/NaB-K	GMV(L)-R36G/NaB-K
Cooling Capacity		kW	2.2	2.8	3.6
		Btu	7507	9554	12284
Heating Capacity		kW	2.5	3.2	4.0
		Btu	8530	10919	13649
Air Flow Rate		m3/h	360	360	500
		CFM	212	212	294
Sound Pressure Level (H/L)		dB(A)	37/28	37/28	43/28
External Static Pressure		Pa			
Power Supply			220-240V~50Hz	220-240V~50Hz	220-240V~50Hz
Fan Motor	Output	kW	0.014	0.014	0.022
	Running Current	A	0.15	0.15	0.22
Connecting Pipes	Gas Pipe	mm	Φ9.52	Φ9.52	Φ12.7
		inch	Φ3/8	Φ3/8	Φ1/2
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35
		inch	Φ1/4	Φ1/4	Φ1/4
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ20×1.5	φ20×1.5	φ20×1.5
Unit Dimensions (W×D×H)		mm	830×189×285	830×189×285	830×189×285
Package Dimensions (W×D×H)		mm	995×394×268	995×394×268	995×394×268
Weight（Net/Gross）		kg	8/14.3	8/14.3	11/15.8

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R45G/NaB-K	GMV(L)-R50G/NaB-K	GMV(L)-R56G/NaB-K
Cooling Capacity		kW	4.5	5.0	5.6
		Btu	15355	17061	19108
Heating Capacity		kW	5.0	5.8	6.3
		Btu	17061	19790	21496
Air Flow Rate		m3/h	500	700	750
		CFM	294	412	441
Sound Pressure Level (H/L)		dB(A)	43/28	45/40	45/40
External Static Pressure		Pa			
Power Supply			220-240V~50Hz	220-240V~50Hz	220-240V~50Hz
Fan Motor	Output	kW	0.022	0.02	0.02
	Running Current	A	0.22	0.25	0.26
Connecting Pipes	Gas Pipe	mm	Φ12.7	Φ12.7	Φ15.9
		inch	Φ1/2	Φ1/2	Φ5/8
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ9.52
		inch	Φ1/4	Φ1/4	Φ3/8
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ20×1.5	Φ30×1.5	Φ30×1.5
Unit Dimensions (W×D×H)		mm	830×189×285	1020×228×310	1020×228×310
Package Dimensions (W×D×H)		mm	1006×385×265	1178×325×390	1178×325×390
Weight（Net/Gross）		kg	11/15.8	15.5/20.5	15.5/20.5

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R22G/NaC-K	GMV(L)-R28G/NaC-K	GMV(L)-R36G/NaC-K
Cooling Capacity		kW	2.2	2.8	3.6
		Btu	7507	9554	12284
Heating Capacity		kW	2.5	3.2	4.0
		Btu	8530	10919	13649
Air Flow Rate		m3/h	360	360	500
		CFM	212	212	294
Sound Pressure Level (H/L)		dB(A)	37/28	37/28	43/28
External Static Pressure		Pa			
Power Supply			220-240V~50Hz	220-240V~50Hz	220-240V~50Hz
Fan Motor	Output	kW	0.014	0.014	0.022
	Running Current	A	0.15	0.15	0.22
Connecting Pipes	Gas Pipe	mm	Φ9.52	Φ9.52	Φ12.7
		inch	Φ3/8	Φ3/8	Φ1/2
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35
		inch	Φ1/4	Φ1/4	Φ1/4
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ20×1.5	φ20×1.5	φ20×1.5
Unit Dimensions (W×D×H)		mm	770×190×250	770×190×250	830×189×285
Package Dimensions (W×D×H)		mm	955×330×272	955×272×330	1006×395×295
Weight（Net/Gross）		kg	8/14.3	8/14.3	11/15.8

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R45G/NaC-K	GMV(L)-R71G/Na-K	GMV(L)-R80G/Na-K
Cooling Capacity		kW	4.5	7.1	8.0
		Btu	15355	24226	27297
Heating Capacity		kW	5.0	8.0	9.0
		Btu	17061	27297	30709
Air Flow Rate		m3/h	500	1200	1200
		CFM	294	706	706
Sound Pressure Level (H/L)		dB(A)	43/28	49/42	49/42
External Static Pressure		Pa	0	0	0
Power Supply			220-240V~50Hz	220-240V~50Hz	220-240V~50Hz
Fan Motor	Output	kW	0.022	0.026	0.026
	Running Current	A	0.22	0.29	0.39
Connecting Pipes	Gas Pipe	mm	Φ12.7	Φ15.9	Φ15.9
		inch	Φ1/2	Φ5/8	Φ5/8
	Liquid Pipe	mm	Φ6.35	Φ9.52	Φ9.52
		inch	Φ1/4	Φ3/8	Φ3/8
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ30×1.5	φ30×1.5	φ30×1.5
Unit Dimensions (W×D×H)		mm	830×189×285	1178×227×326	1178×227×326
Package Dimensions (W×D×H)		mm	1006×395×295	1365×417×333	1365×417×333
Weight（Net/Gross）		kg	11/15.8	17.5/23	17.5/23

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R71G/Na-K	GMV(L)-R80G/Na-K
Cooling Capacity		kW	7.1	8.0
		Btu	24226	27297
Heating Capacity		kW	8.0	9.0
		Btu	27297	30709
Air Flow Rate		m3/h	1200	1200
		CFM	706	706
Sound Pressure Level (H/L)		dB(A)	49/42	49/42
External Static Pressure		Pa		
Power Supply			220-240V~50Hz	220-240V~50Hz
Fan Motor	Output	kW	0.026	0.026
	Running Current	A	0.29	0.39
Connecting Pipes	Gas Pipe	mm	Φ15.9	Φ15.9
		inch	Φ5/8	Φ5/8
	Liquid Pipe	mm	Φ9.52	Φ9.52
		inch	Φ3/8	Φ3/8
	Connection Method		Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	φ30×1.5	φ30×1.5
Unit Dimensions (W×D×H)		mm	1178×227×326	1178×227×326
Package Dimensions (W×D×H)		mm	1365×417×333	1365×417×333
Weight（Net/Gross）		kg	17.5/23	17.5/23

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

4.2.4Floor Ceiling Type

Model			GMV(L)-R28Zd/Na-K	GMV(L)-R36Zd/Na-K	GMV(L)-R50Zd/Na-K
Cooling Capacity		kW	2.8	3.6	5.0
		Btu	9554	12284	17061
Heating Capacity		kW	3.2	4.0	5.8
		Btu	10919	13649	19790
Air Flow Rate		m3/h	550	600	700
		CFM	324	353	412
Sound Pressure Level (H/L)		dB(A)	43/-	44/-	50/-
External Static Pressure		Pa	0	0	0
Power Supply			220-240V~50Hz	220-240V~50Hz	220-240V~50Hz
Fan Motor	Output	kW	0.01	0.01	0.04
	Running Current	A	0.1	0.1	0.4
Connecting Pipes	Gas Pipe	mm	Φ9.52	Φ12.7	Φ12.7
		inch	Φ3/8	Φ1/2	Φ1/2
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35
		inch	Φ1/4	Φ1/4	Φ1/4
	Connection Method		Flare Connection	Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ17×1.75	Φ17×1.75	Φ17×1.75
Unit Dimensions (W×D×H)		mm	840×238×695	840×238×695	840×238×695
Package Dimensions (W×D×H)		mm	1035×295×805	1035×295×805	1035×295×805
Weight（Net/Gross）		kg	28/37	28/37	28/37

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R71Zd/Na-K	GMV(L)-R90Zd/Na-K
Cooling Capacity		kW	7.1	9.0
		Btu	24226	30709
Heating Capacity		kW	8.0	10.0
		Btu	27297	34121
Air Flow Rate		m3/h	1170	2100
		CFM	689	1236
Sound Pressure Level (H/L)		dB(A)	48/-	51/-
External Static Pressure		Pa	0	0
Power Supply			220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.1	0.15
	Running Current	A	1	1.5
Connecting Pipes	Gas Pipe	mm	Φ15.9	Φ15.9
		inch	Φ5/8	5/8
	Liquid Pipe	mm	Φ9.52	Φ9.52
		inch	Φ3/8	3/8
	Connection Method		Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ17×1.75	Φ17×1.75
Unit Dimensions(W×D×H)		mm	1300×188×600	1590×238×695
Package Dimensions(W×D×H)		mm	1514×248×724	1714×330×830
Weight（Net/Gross）		kg	34/38	44/53

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

Model			GMV(L)-R112Zd/Na-K	GMV(L)-R125Zd/Na-K
Cooling Capacity		kW	11.2	12.5
		Btu	38216	42652
Heating Capacity		kW	12.5	13.5
		Btu	42652	46064
Air Flow Rate		m3/h	2200	2300
		CFM	1295	1354
Sound Pressure Level (H/L)		dB(A)	54/-	55/-
External Static Pressure		Pa	0	0
Power Supply			220-240V～50Hz	220-240V～50Hz
Fan Motor	Output	kW	0.18	0.18
	Running Current	A	1.8	1.8
Connecting Pipes	Gas Pipe	mm	Φ15.9	Φ15.9
		inch	5/8	5/8
	Liquid Pipe	mm	Φ9.52	Φ9.52
		inch	3/8	3/8
	Connection Method		Flare Connection	Flare Connection
Drain Pipes （External Dia. × Thickness）		mm	Φ17×1.75	Φ17×1.75
Unit Dimensions (W×D×H)		mm	1590×238×695	1590×238×695
Package Dimensions (W×D×H)		mm	1714×330×830	1714×330×830
Weight（Net/Gross）		kg	44/53	44/53

Notes:

① Refer to the product nameplate for parameters and specification of the unit;

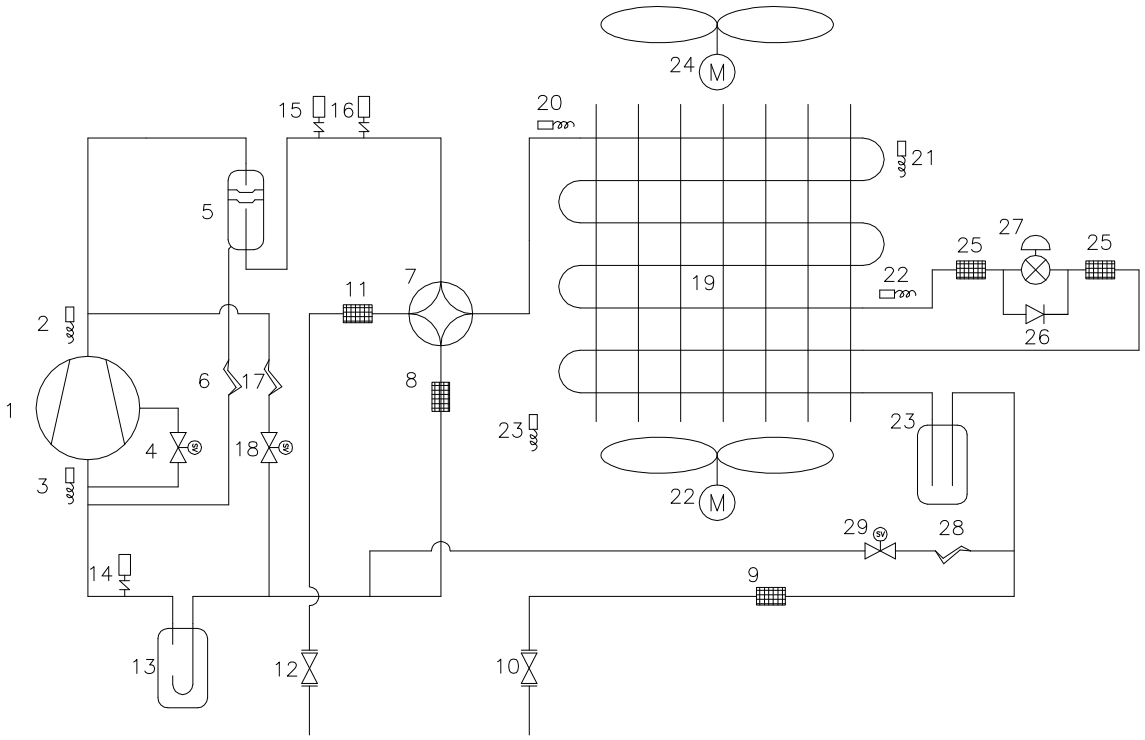
② The model with GMVL code is cooling only unit; while the model with GMV code is heat pump unit; the cooling only units does not have any parameters of performing heating;

③ The sound level is tested under circumstance of semi-anechoic chamber; the value of noise could be a little higher in actual operation.

4.3 Operation Range

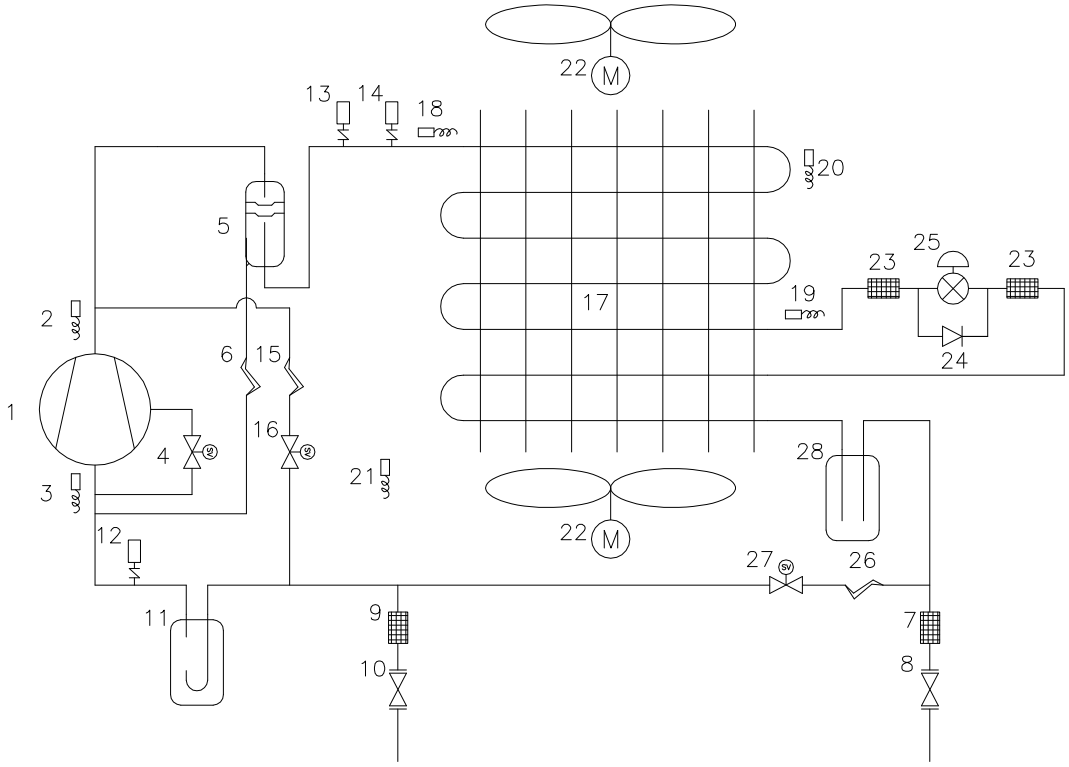
Model	Range of outdoor temperature℃(℉)
Cooling	16℃(61℉)～30℃(85℉)
Heating	16℃(61℉)～30℃(85℉)

5 PIPING DIAGRAM



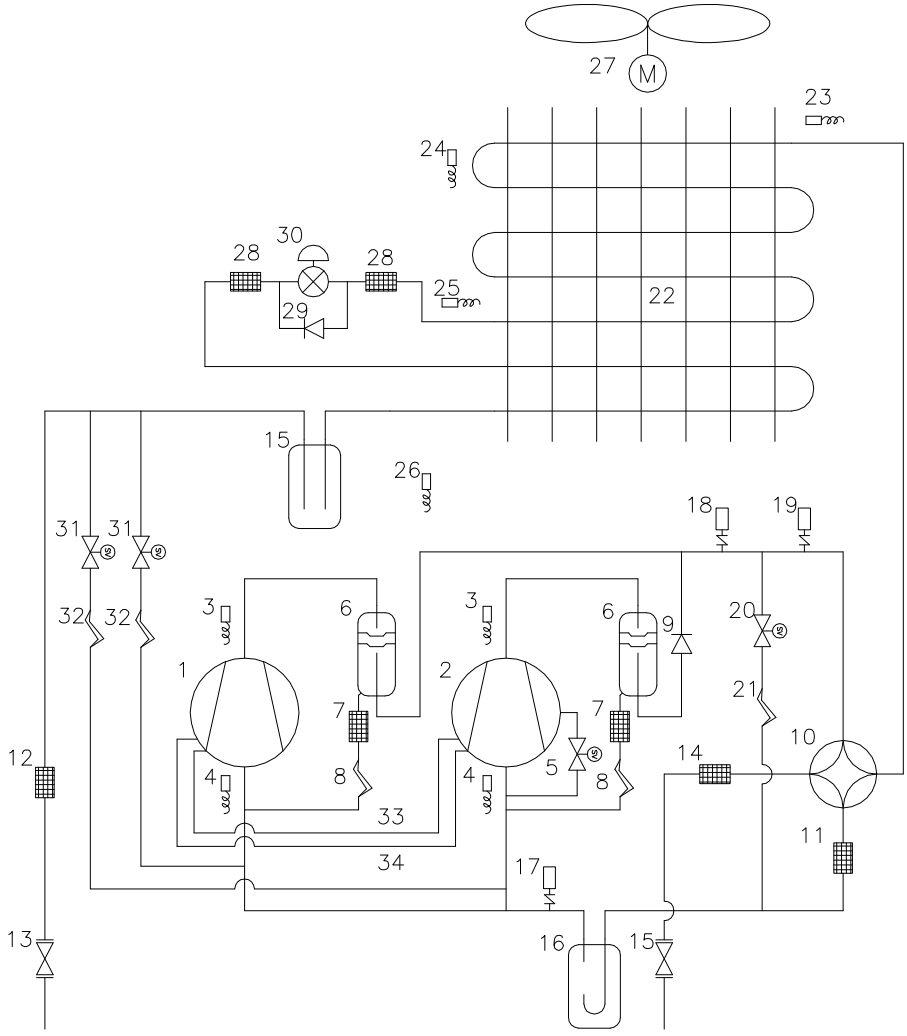
GMV-R120W/Na-K, GMV-R160W/Na-M

1	Digital compressor	16	High pressure swich
2	Compressor discharge pipe thermistor	17	Gas by-pass value sub-assy: Capillary
3	Compressor oil thermistor	18	Gas by-pass value sub-assy: Electromagnetic value
4	PWM value	19	Condenser
5	Oil separator	20	Condenser inlet pipe thermistor
6	Oil separator sub-assy: Capillary	21	Condenser middle pipe thermistor
7	4-Way valve	22	Condenser outlet pipe thermistor
8	4-Way valve sub-assy: Filter	23	Ambient thermistor
9	Liquid valve sub-assy: Drier	24	Outdoor fan
10	Liquid valve	25	EXV sub-assy:Filter
11	Gas valve sub-assy:Filter	26	EXV sub-assy: One way valve
12	Gas valve	27	EXV sub-assy: Electronic expansion value
13	Gas-liquid separator	28	Liquid by-pass value sub-assy: Capillary
14	Low pressure sensor	29	Liquid by-pass value sub-assy: Electromagnetic value
15	High pressure sensor		



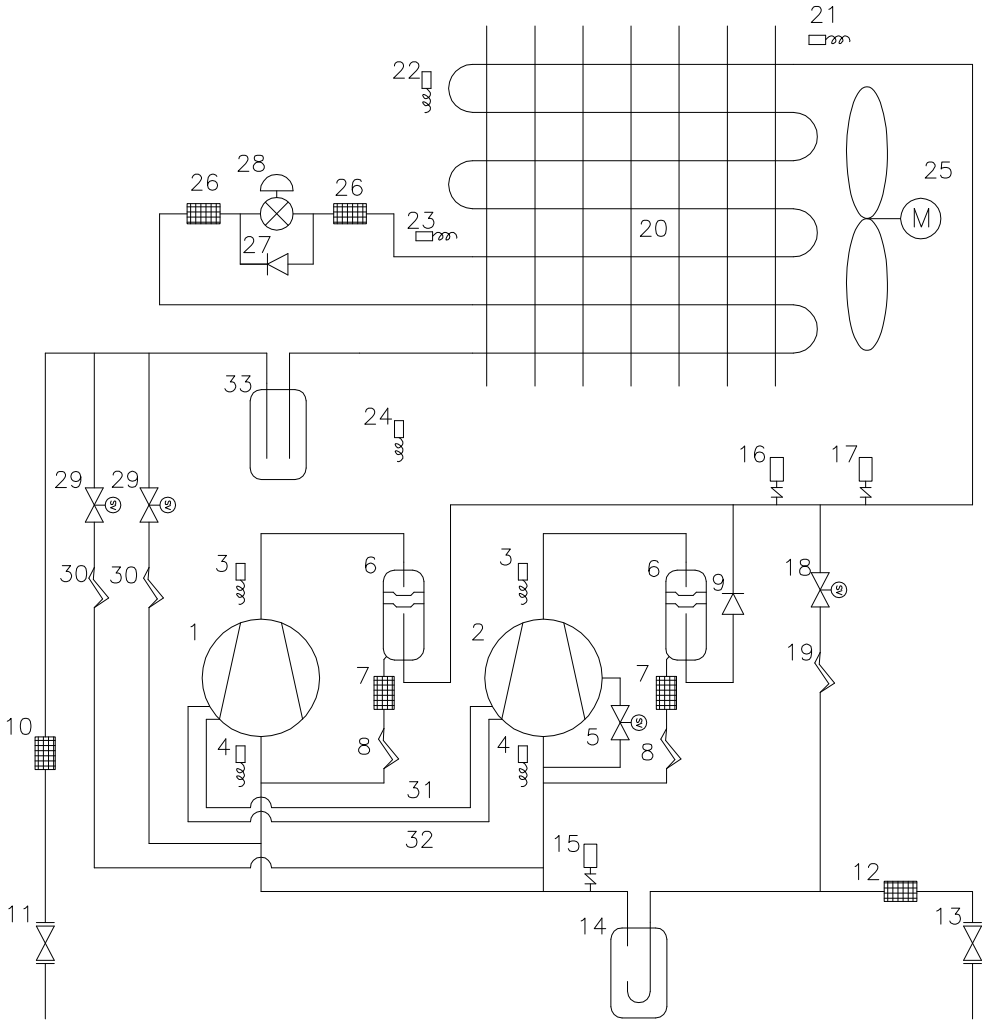
GMVL-R120W/Na-K, GMVL-R160W/Na-M

1	Digital compressor	16	Gas by-pass value sub-assy: Electromagnetic value
2	Compressor discharge pipe thermistor	17	Condenser
3	Compressor oil thermistor	18	Condenser inlet pipe thermistor
4	PWM value	19	Condenser middle pipe thermistor
5	Oil separator	20	Condenser outlet pipe thermistor
6	Oil separator sub-assy: Capillary	21	Ambient thermistor
7	Liquid valve sub-assy: Drier	22	Outdoor fan
8	Liquid valve	23	EXV sub-assy:Filter
9	Gas valve sub-assy:Filter	24	EXV sub-assy: One way valve
10	Gas valve	25	EXV sub-assy: Electronic expansion value
11	Gas-liquid separator	26	Liquid by-pass value sub-assy: Capillary
12	Low pressure sensor	27	Liquid by-pass value sub-assy: Electromagnetic value
13	High pressure sensor	28	Liquid accumulator
14	High pressure swich		
15	Gas by-pass value sub-assy: Capillary		



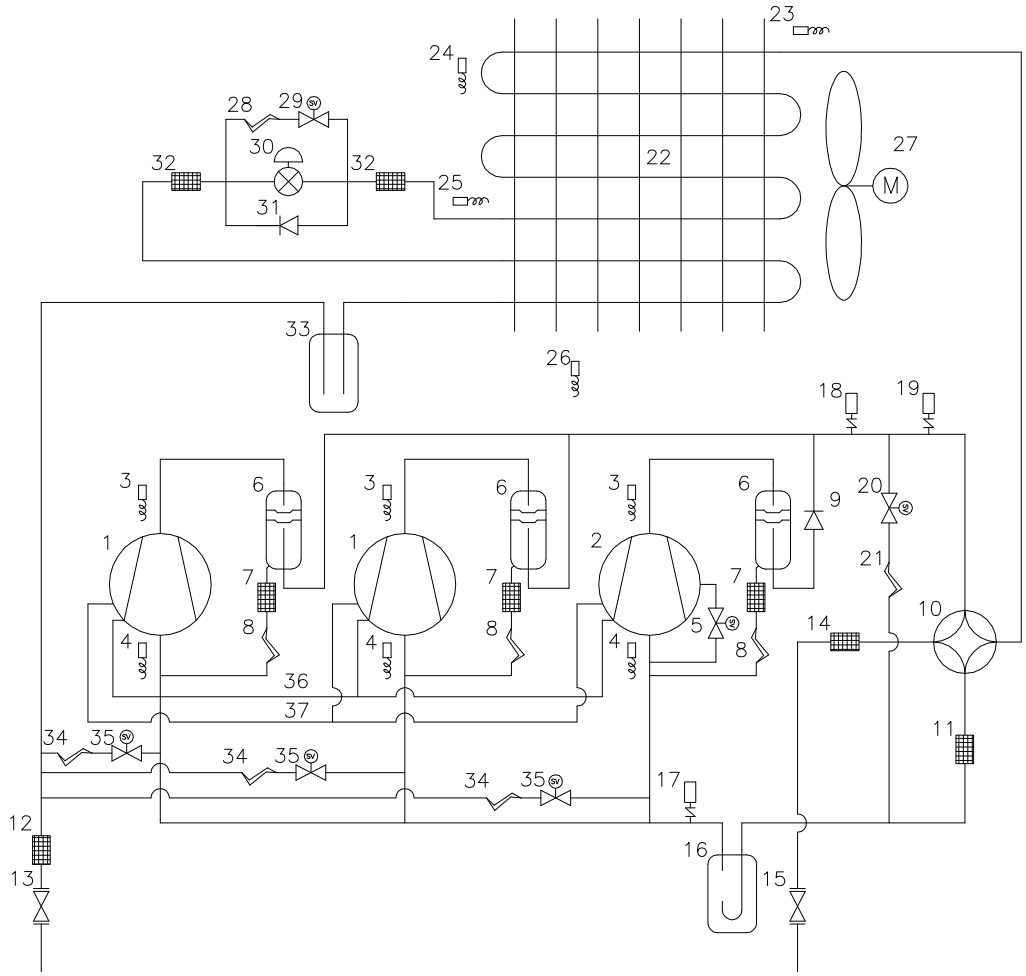
GMV-R260W2/Na- M, GMV-R300W2/Na-M

1	Constant-speed compressor	18	High pressure sensor
2	Digital compressor	19	High pressure swich
3	Compressor discharge pipe thermistor	20	Gas by-pass value sub-assy: Electromagnetic value
4	Compressor oil thermistor	21	Gas by-pass value sub-assy: Capillary
5	PWM value	22	Condenser
6	Oil separator	23	Condenser inlet pipe thermistor
7	Oil separator sub-assy: Filter	24	Condenser middle pipe thermistor
8	Oil separator sub-assy: Capillary	25	Condenser outlet pipe thermistor
9	Oil separator sub-assy: One way valve	26	Ambient thermistor
10	4-Way valve	27	Outdoor fan
11	4-Way valve sub-assy: Filter	28	EXV sub-assy:Filter
12	Liquid valve sub-assy: Drier	29	EXV sub-assy: One way valve
13	Liquid valve	30	Electronic expansion valve
14	Gas valve sub-assy:Filter	31	Liquid by-pass value sub-assy: Electromagnetic value
15	Gas valve	32	Liquid by-pass value sub-assy: Capillary
16	Gas-liquid separator	33	Oil equalization pipe
17	Low pressure sensor	34	Gas equalization pipe



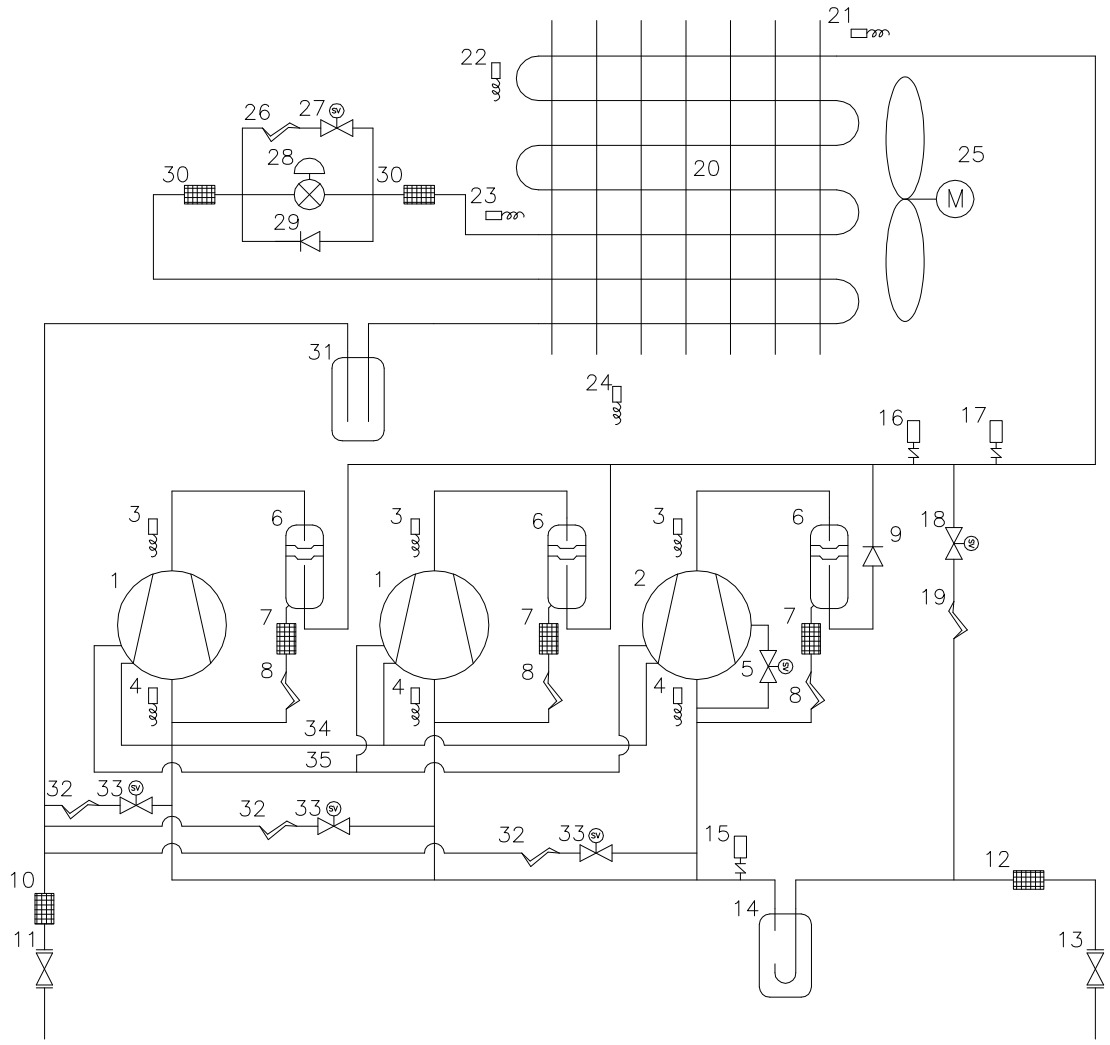
GMVL-R260W2/Na- M, GMVL-R300W2/Na-M

1	Constant-speed compressor	18	Gas by-pass value sub-assy: Electromagnetic value
2	Digital compressor	19	Gas by-pass value sub-assy: Capillary
3	Compressor discharge pipe thermistor	20	Condenser
4	Compressor oil thermistor	21	Condenser inlet pipe thermistor
5	PWM value	22	Condenser middle pipe thermistor
6	Oil separator	23	Condenser outlet pipe thermistor
7	Oil separator sub-assy: Filter	24	Ambient thermistor
8	Oil separator sub-assy: Capillary	25	Outdoor fan
9	Oil separator sub-assy: One way valve	26	EXV sub-assy:Filter
10	Liquid valve sub-assy: Drier	27	EXV sub-assy: One way valve
11	Liquid valve	28	Electronic expansion valve
12	Gas valve sub-assy:Filter	29	Liquid by-pass value sub-assy: Electromagnetic value
13	Gas valve	30	Liquid by-pass value sub-assy: Capillary
14	Gas-liquid separator	31	Oil equalization pipe
15	Low pressure sensor	32	Gas equalization pipe
16	High pressure sensor	33	Liquid accumulator
17	High pressure swich	34	



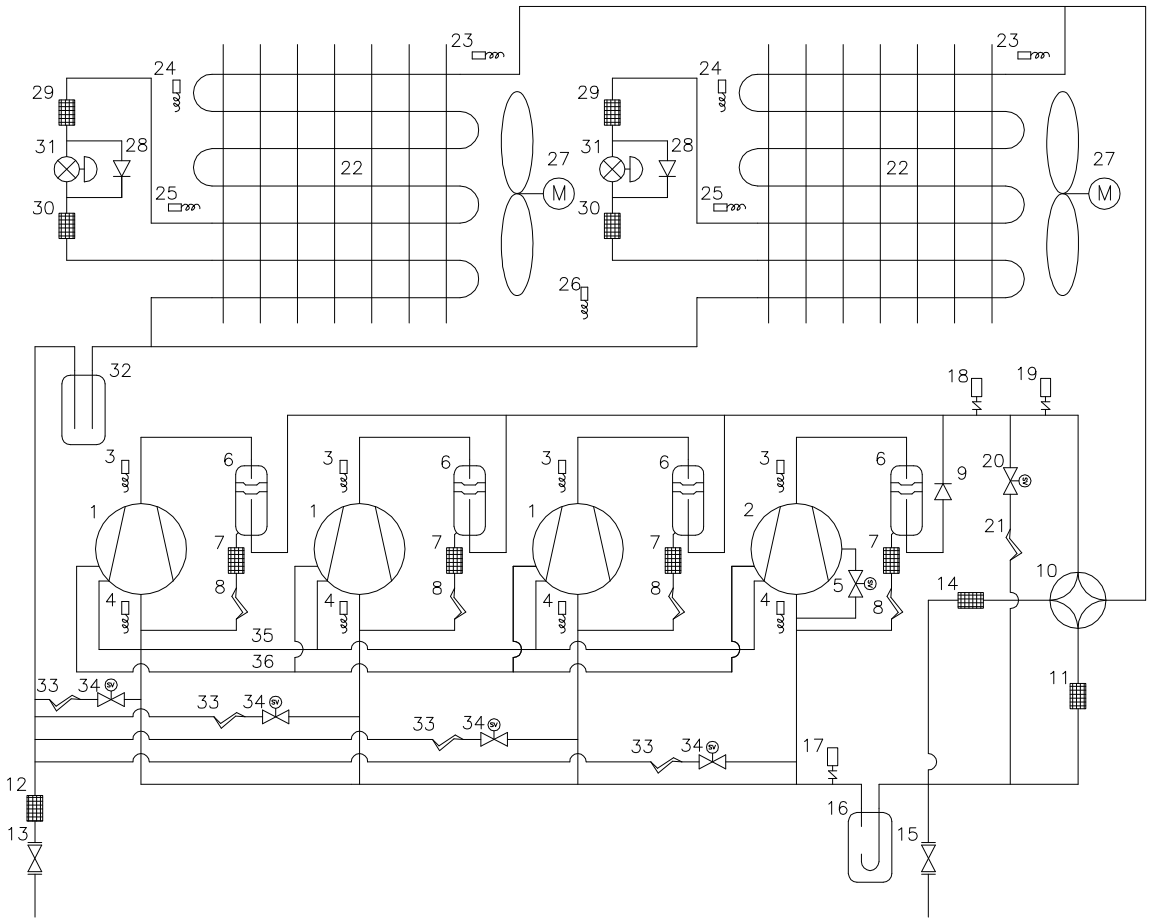
GMV-R450W3/Na-M

1	Constant-speed compressor	20	Gas by-pass value sub-assy: Electromagnetic value
2	Digital compressor	21	Gas by-pass value sub-assy: Capillary
3	Compressor discharge pipe thermistor	22	Condenser
4	Compressor oil thermistor	23	Condenser inlet pipe thermistor
5	PWM value	24	Condenser middle pipe thermistor
6	Oil separator	25	Condenser outlet pipe thermistor
7	Oil separator sub-assy: Filter	26	Ambient thermistor
8	Oil separator sub-assy: Capillary	27	Outdoor fan
9	Oil separator sub-assy: One way valve	28	EXV sub-assy: Capillary
10	4-Way valve	29	EXV sub-assy: Electromagnetic value
11	4-Way valve sub-assy: Filter	30	Electronic expansion valve
12	Liquid valve sub-assy: Drier	31	EXV sub-assy: One way valve
13	Liquid valve	32	EXV sub-assy: Filter
14	Gas valve sub-assy:Filter	33	Liquid accumulator
15	Gas valve	34	Liquid by-pass value sub-assy: Capillary
16	Gas-liquid separator	35	Liquid by-pass value sub-assy: Electromagnetic value
17	Low pressure sensor	36	Oil equalization pipe
18	High pressure sensor	37	Gas equalization pipe
19	High pressure swich		



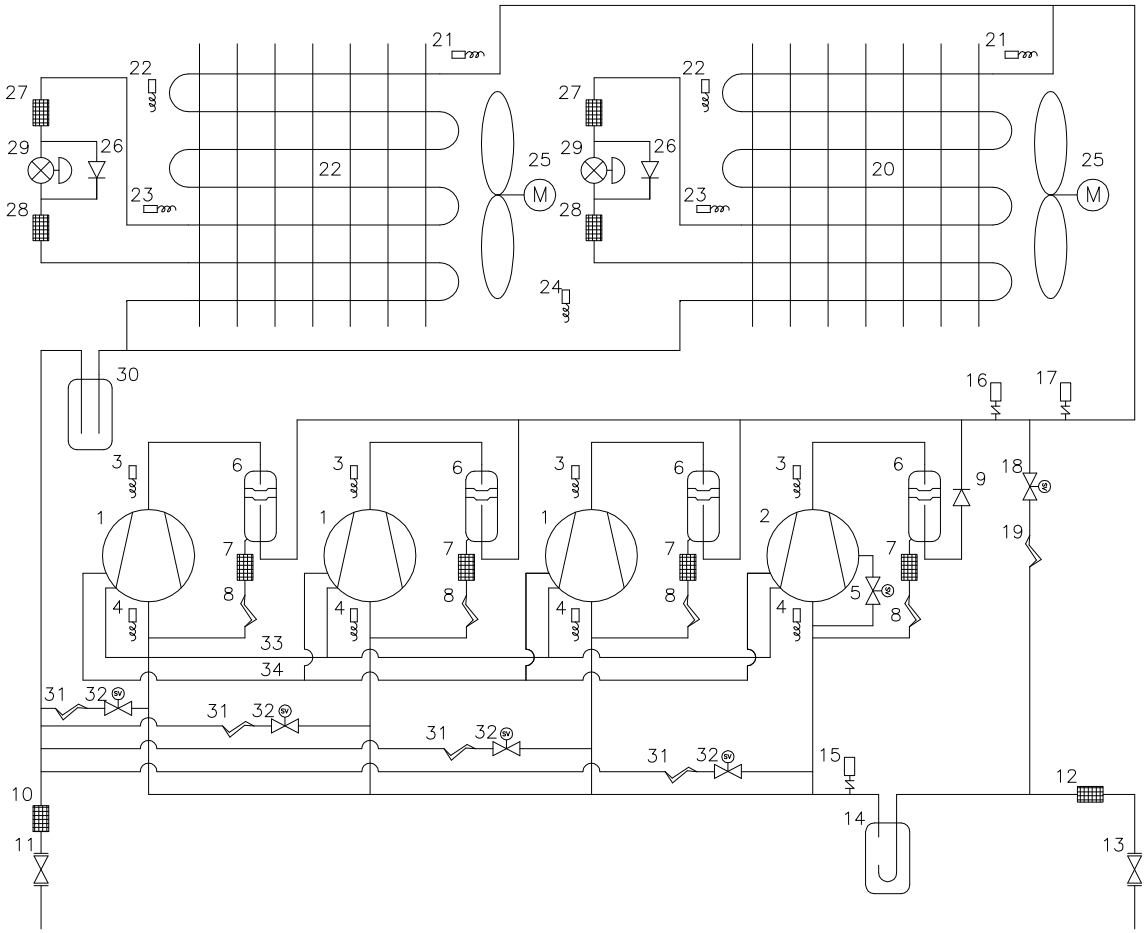
GMVL-R450W3/Na-M

1	Constant-speed compressor	19	Gas by-pass value sub-assy: Capillary
2	Digital compressor	20	Condenser
3	Compressor discharge pipe thermistor	21	Condenser inlet pipe thermistor
4	Compressor oil thermistor	22	Condenser middle pipe thermistor
5	PWM value	23	Condenser outlet pipe thermistor
6	Oil separator	24	Ambient thermistor
7	Oil separator sub-assy: Filter	25	Outdoor fan
8	Oil separator sub-assy: Capillary	26	EXV sub-assy: Capillary
9	Oil separator sub-assy: One way valve	27	EXV sub-assy: Electromagnetic value
10	Liquid valve sub-assy: Filter	28	Electronic expansion valve
11	Liquid valve	29	EXV sub-assy: One way valve
12	Gas valve sub-assy: Filter	30	EXV sub-assy: Filter
13	Gas valve	31	Liquid accumulator
14	Gas-liquid separator	32	Liquid by-pass value sub-assy: Capillary
15	Low pressure sensor	33	Liquid by-pass value sub-assy: Electromagnetic value
16	High pressure sensor	34	Oil equalization pipe
17	High pressure swich	35	Gas equalization pipe
18	Gas by-pass value sub-assy: Electromagnetic value		



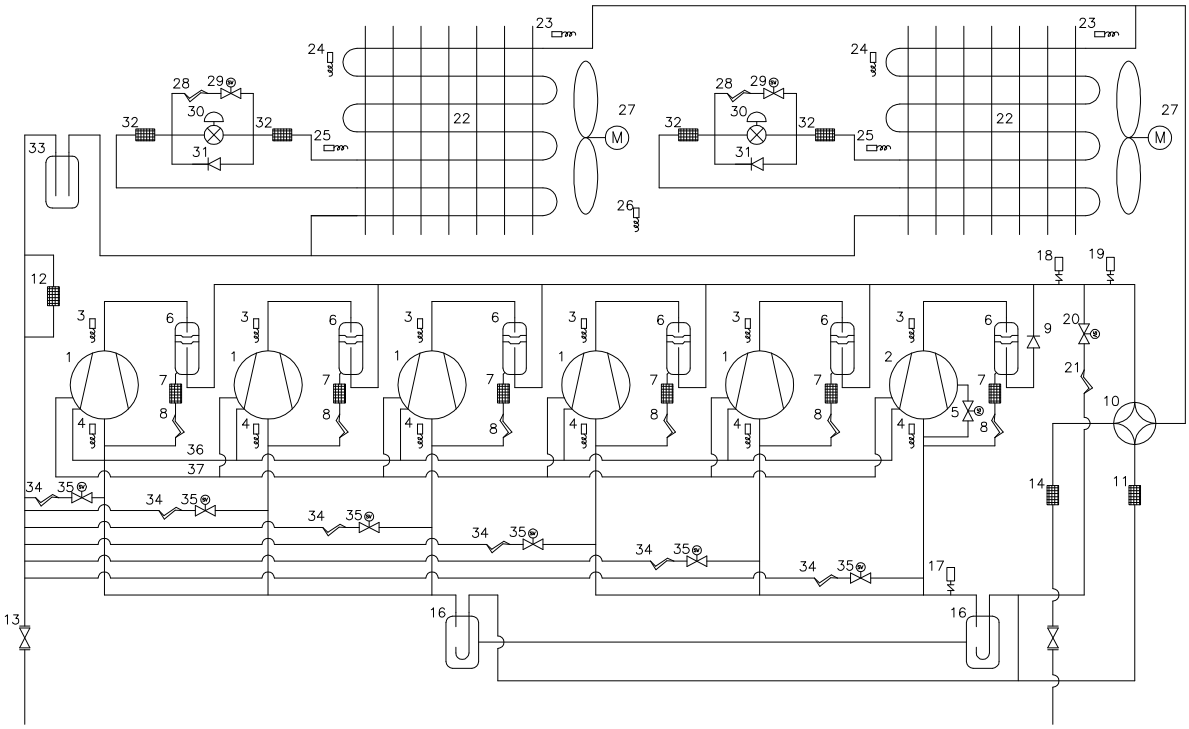
GMV-R560W4/Na-M, GMV-R600W4/Na-M

1	Constant-speed compressor	19	High pressure swich
2	Digital compressor	20	Gas by-pass value sub-assy: Electromagnetic value
3	Compressor discharge pipe thermistor	21	Gas by-pass value sub-assy: Capillary
4	Compressor oil thermistor	22	Condenser
5	PWM value	23	Condenser inlet pipe thermistor
6	Oil separator	24	Condenser middle pipe thermistor
7	Oil separator sub-assy: Filter	25	Condenser outlet pipe thermistor
8	Oil separator sub-assy: Capillary	26	Ambient thermistor
9	Oil separator sub-assy: One way valve	27	Outdoor fan
10	4-Way valve	28	EXV sub-assy: One way valve
11	4-Way valve sub-assy: Filter	29	EXV sub-assy: Filter
12	Liquid valve sub-assy: Filter	30	EXV sub-assy: Drier
13	Liquid valve	31	Electronic expansion valve
14	Gas valve sub-assy: Filter	32	Liquid accumulator
15	Gas valve	33	Liquid by-pass value sub-assy: Capillary
16	Gas-liquid separator	34	Liquid by-pass value sub-assy: Electromagnetic value
17	Low pressure sensor	35	Oil equalization pipe
18	High pressure sensor	36	Gas equalization pipe



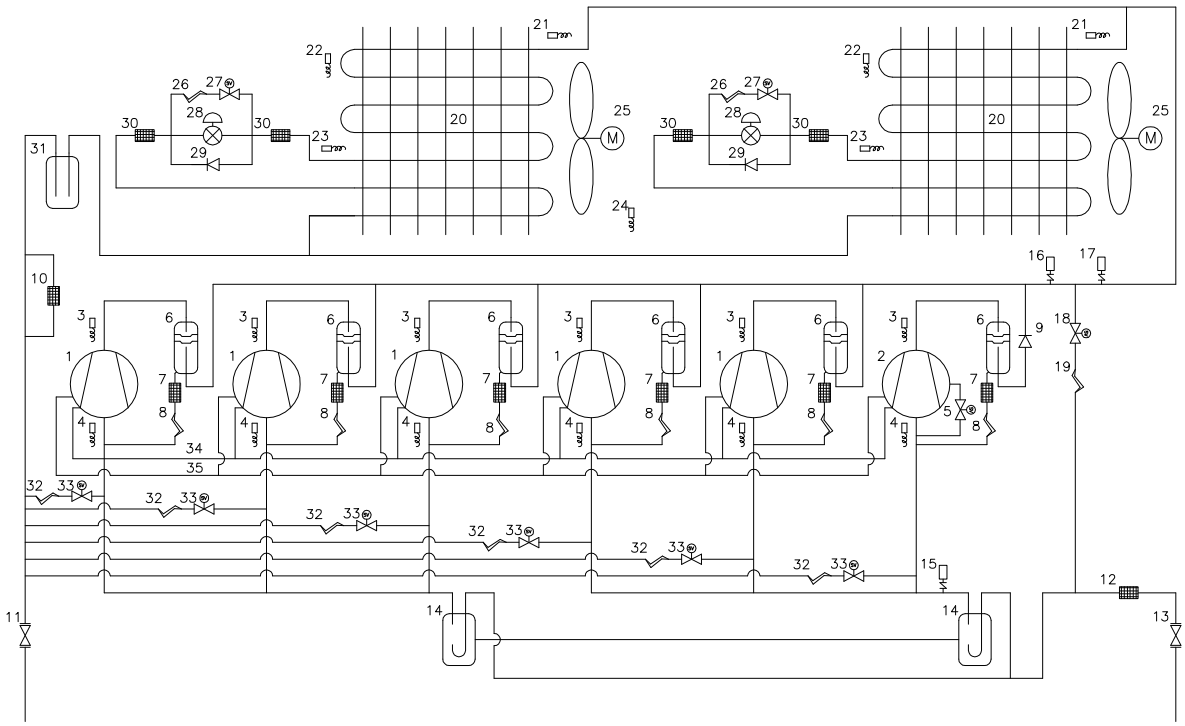
GMVL-R560W4/Na-M, GMVL-R600W4/Na-M

1	Constant-speed compressor	18	Gas by-pass value sub-assy: Electromagnetic value
2	Digital compressor	19	Gas by-pass value sub-assy: Capillary
3	Compressor discharge pipe thermistor	20	Condenser
4	Compressor oil thermistor	21	Condenser inlet pipe thermistor
5	PWM value	22	Condenser middle pipe thermistor
6	Oil separator	23	Condenser outlet pipe thermistor
7	Oil separator sub-assy: Filter	24	Ambient thermistor
8	Oil separator sub-assy: Capillary	25	Outdoor fan
9	Oil separator sub-assy: One way valve	26	EXV sub-assy: One way valve
10	Liquid valve sub-assy: Filter	27	EXV sub-assy: Filter
11	Liquid valve	28	EXV sub-assy: Drier
12	Gas valve sub-assy: Filter	29	Electronic expansion valve
13	Gas valve	30	Liquid accumulator
14	Gas-liquid separator	31	Liquid by-pass value sub-assy: Capillary
15	Low pressure sensor	32	Liquid by-pass value sub-assy: Electromagnetic value
16	High pressure sensor	33	Oil equalization pipe
17	High pressure swich	34	Gas equalization pipe



GMV-R860W6/Na-M, GMV-R900W6/Na-M

1	Constant-speed compressor	20	Gas by-pass value sub-assy: Electromagnetic value
2	Digital compressor	21	Gas by-pass value sub-assy: Capillary
3	Compressor discharge pipe thermistor	22	Condenser
4	Compressor oil thermistor	23	Condenser inlet pipe thermistor
5	PWM value	24	Condenser middle pipe thermistor
6	Oil separator	25	Condenser outlet pipe thermistor
7	Oil separator sub-assy: Filter	26	Ambient thermistor
8	Oil separator sub-assy: Capillary	27	Outdoor fan
9	Oil separator sub-assy: One way valve	28	EXV sub-assy: Capillary
10	4-Way valve	29	EXV sub-assy: Electromagnetic value
11	4-Way valve sub-assy: Filter	30	Electronic expansion valve
12	Liquid valve sub-assy: Drier	31	EXV sub-assy: One way valve
13	Liquid valve	32	EXV sub-assy: Filter
14	Gas valve sub-assy: Filter	33	Liquid accumulator
15	Gas valve	34	Liquid by-pass value sub-assy: Capillary
16	Gas-liquid separator	35	Liquid by-pass value sub-assy: Electromagnetic value
17	Low pressure sensor	36	Oil equalization pipe
18	High pressure sensor	37	Gas equalization pipe
19	High pressure swich		



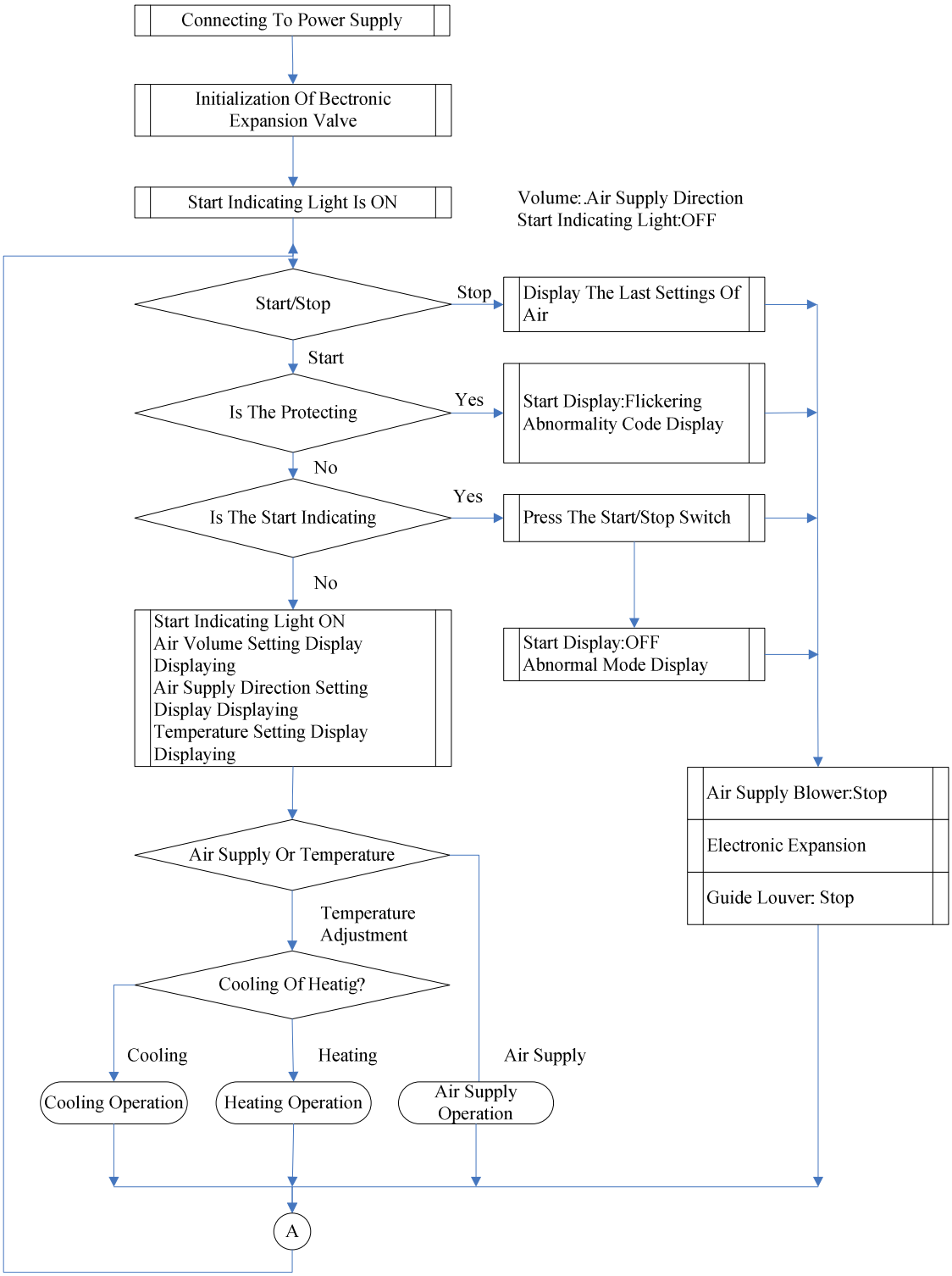
GMVL-R860W6/Na-M, GMVL-R900W6/Na-M

1	Constant-speed compressor	19	Gas by-pass value sub-assy: Capillary
2	Digital compressor	20	Condenser
3	Compressor discharge pipe thermistor	21	Condenser inlet pipe thermistor
4	Compressor oil thermistor	22	Condenser middle pipe thermistor
5	PWM value	23	Condenser outlet pipe thermistor
6	Oil separator	24	Ambient thermistor
7	Oil separator sub-assy: Filter	25	Outdoor fan
8	Oil separator sub-assy: Capillary	26	EXV sub-assy: Capillary
9	Oil separator sub-assy: One way valve	27	EXV sub-assy: Electromagnetic value
10	Liquid valve sub-assy: Drier	28	Electronic expansion valve
11	Liquid valve	29	EXV sub-assy: One way valve
12	Gas valve sub-assy: Filter	30	EXV sub-assy: Filter
13	Gas valve	31	Liquid accumulator
14	Gas-liquid separator	32	Liquid by-pass value sub-assy: Capillary
15	Low pressure sensor	33	Liquid by-pass value sub-assy: Electromagnetic value
16	High pressure sensor	34	Oil equalization pipe
17	High pressure swich	35	Gas equalization pipe
18	Gas by-pass value sub-assy: Electromagnetic value		

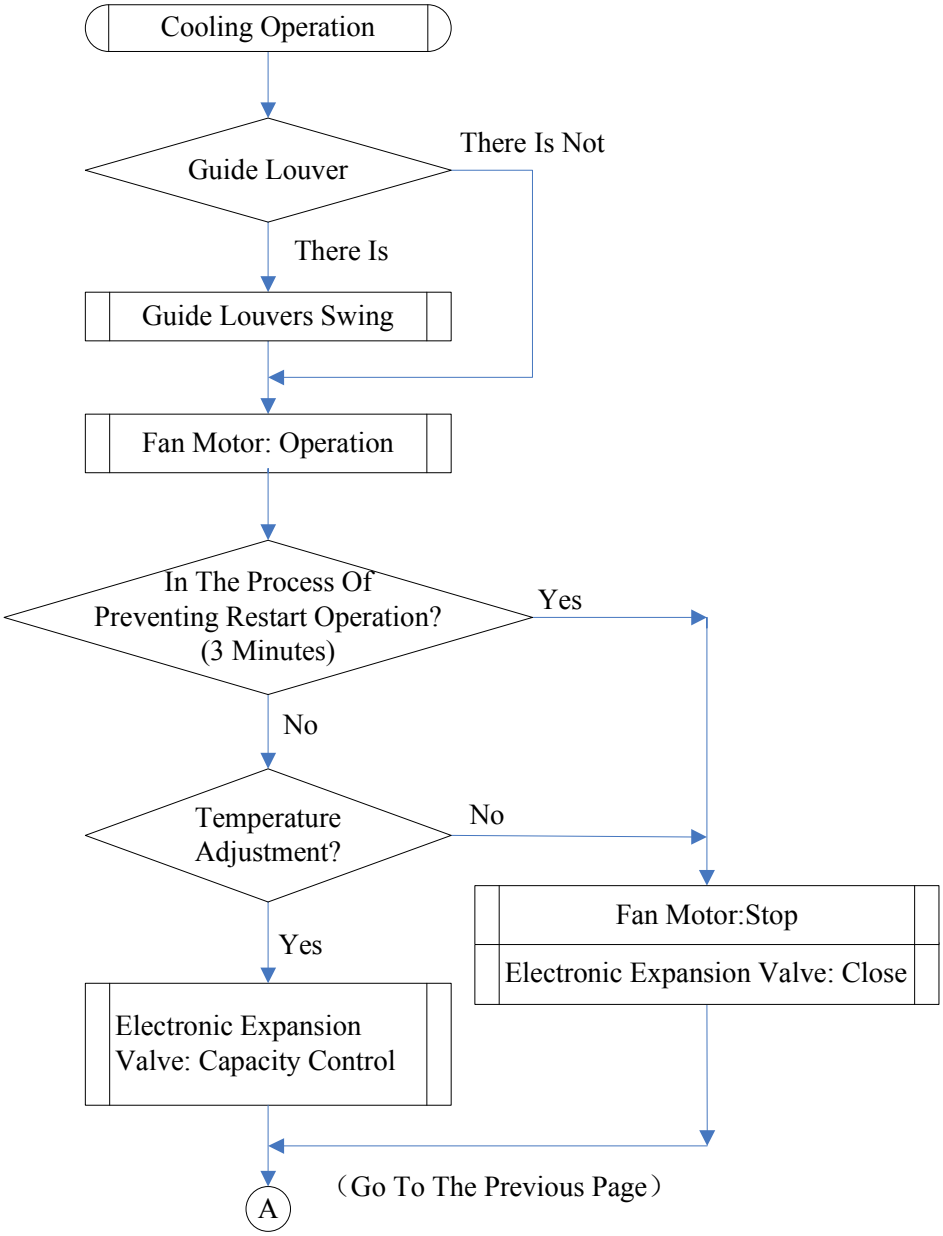
CONTROL

CONTROL

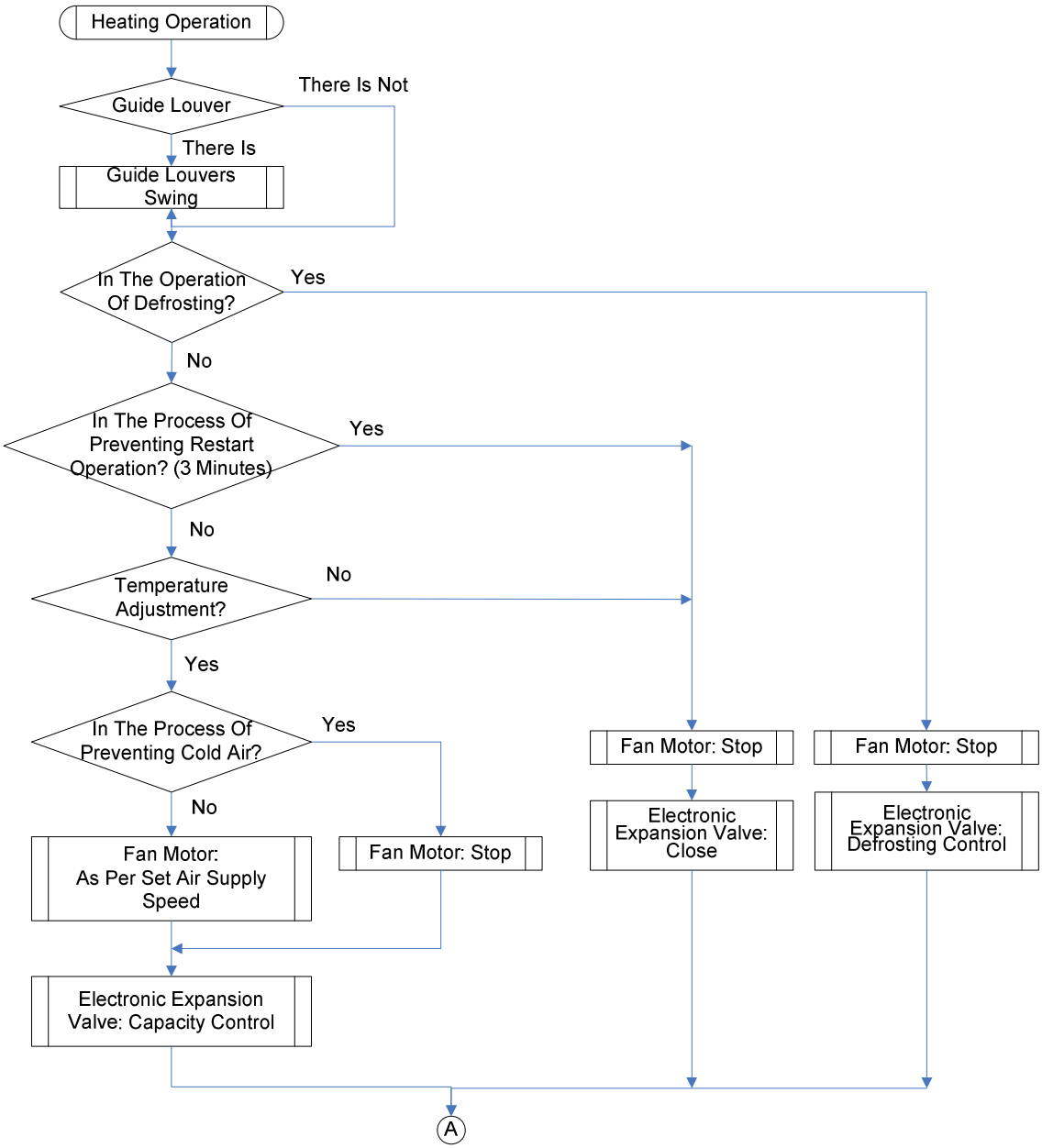
1 OPERATION FLOWCHART



1.1 Cooling/Dehumidfying Operation



1.2 Heating Operation



2 MAIN LOGIC

2.1 Control Function of Outdoor Unit

1) Compressor Capacity Output

It is defined that the full load capacity output of the compressor is 100%.

The compressor capacity output is calculated according to the required indoor load, which is related to the following factors: whether the indoor unit is started, the set temperature, the indoor ambient temperature, the outdoor ambient temperature, etc.

Capacity output calculation of compressor during cooling:

$$Q = \frac{\sum_{i=1}^{j}(q_{iON} A_i)}{\sum_{i=1}^{j} q_i} \times 100\%$$

Capacity output calculation of compressor during heating:

$$Q = \frac{\sum_{i=1}^{j}(q_{iON} A_i + q_{iOFF} \times B_i)}{\sum_{i=1}^{j} q_i} \times 100\%$$

Among which:

Q is the calculated compressor capacity output;

qi is the rated capacity of the indoor unit;

qiON is the rated capacity of indoor unit during running;

qiOFF is the rated capacity of the indoor unit when it is not switched on;

Ai is the set temperature, indoor and outdoor ambient temperature correction, %

Bi is the indoor unit capacity compensation when the heating operation is not running, %

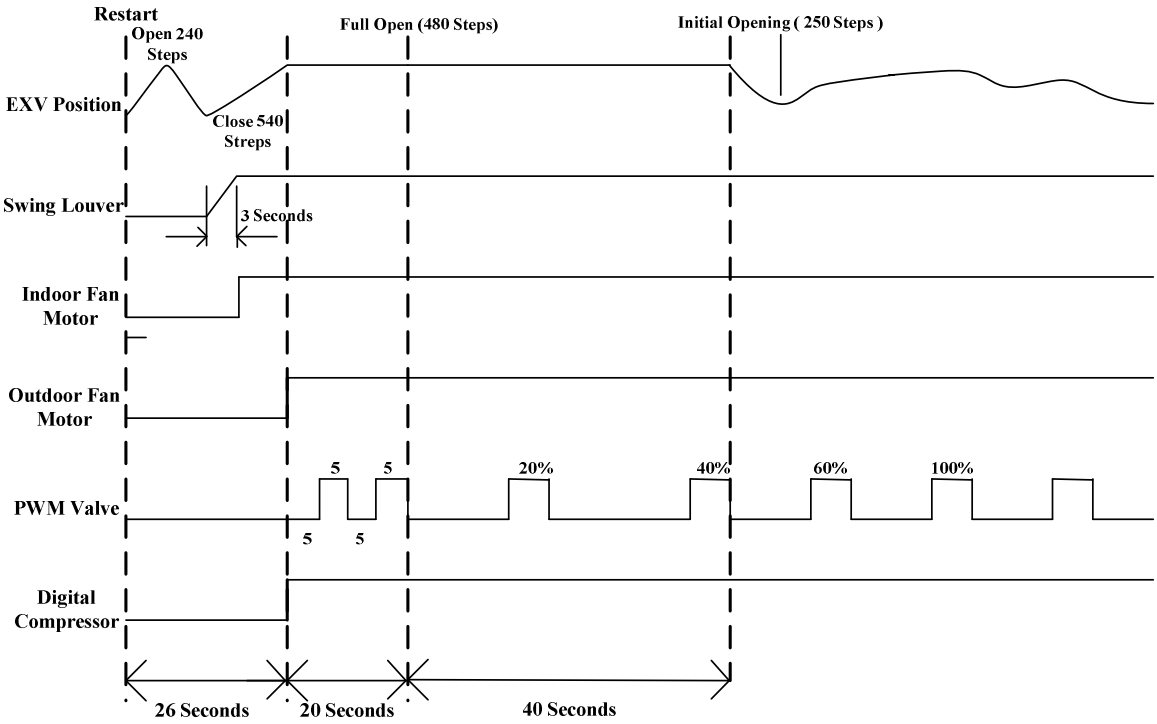
2) Compressor Start Control

◆The shortest operating time of the compressor is 6 minutes. But when the switching-off signal or the protection signal is received, the compressor must stop even if the operation of it has not lasted for 6 minutes.

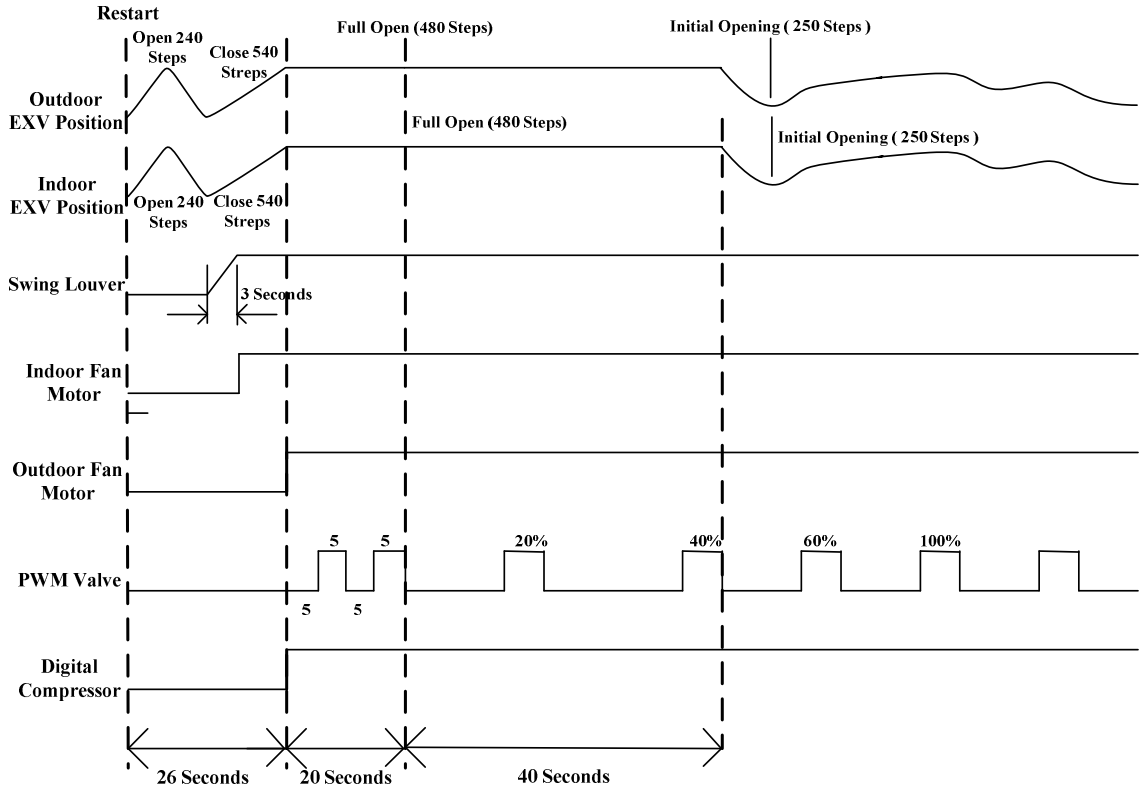
◆The shortest stoppage period of the compressor is 3 minutes. The compressor must not be started at any time within 3 minutes after the compressor is stopped.

◆If the capacity demand of each indoor unit is 0 when the whole unit group is under heating state, the compressor must be stopped (if under the heating operation alone the temperature of stop control is reached , the compressor must be stopped).

★Initial Sequence Chart of Cooling/Dehumidifying Modes:



★ Initial Sequence Chart of Heating Mode:



3) Outdoor Fan Motor Control

There is one 8KW outdoor fan motor which is a double-speed fan motor under 3-grade control: high speed grade, low speed grade and stop; There are two 10KW~15KW outdoor fan motor which are double-speed fan motors under 3-grade control: high speed grade, low speed grade and stop.

The 20KW~30 KW outdoor fan motor is of stepless speed regulation, and stops at 13 grads: 1，2…9，A，B，C.

The detailed control modes are as follows:

(1) Cooling Mode:

When the unit is turned on, the fan motor operates at high speed grade for 250 seconds;

The exhaust pressure is detected 250 seconds after the unit is switched on. The speed grade of the fan motor is adjusted once every three cycles according to the mean value of the exhaust pressure. Refer to the following table for the control:

Absolute pressure of exhaust (Mpa)	≤1.3	1.3＜P＜1.6	≥1.6
Cooling	Go to the lower grade	Remain unchanged	Go to the higher grade

If the fan motor is at the low speed grade, the grade cannot go lower; if the fan motor is at the high speed grade, the grade cannot go higher.

(2) Heating Mode:

When the unit is turned on, the fan motor operates at high speed grade for 250 seconds;

The air suction pressure is detected 250 seconds after the unit is switched on. The speed grade of the fan motor is adjusted once every three cycles according to the mean value of the air suction pressure. Refer to the following table for the control:

Temperature corresponding to the air suction pressure	≤1	1＜P＜6	≥6
cooling	Go to the higher grade	Remain Unchanged	Go to the lower grade

If the fan motor is at the stop grade, the grade cannot go lower; if the fan motor is at the high speed grade, the grade cannot go higher.

4) Compressor Protection Function

a) High Pressure Control

If any one of the two conditions is realized, the high pressure protection function is activated:

Condition 1: The high pressure reaches 3.0Mpa, which is the protection-starting value, then the high pressure switch disconnects;

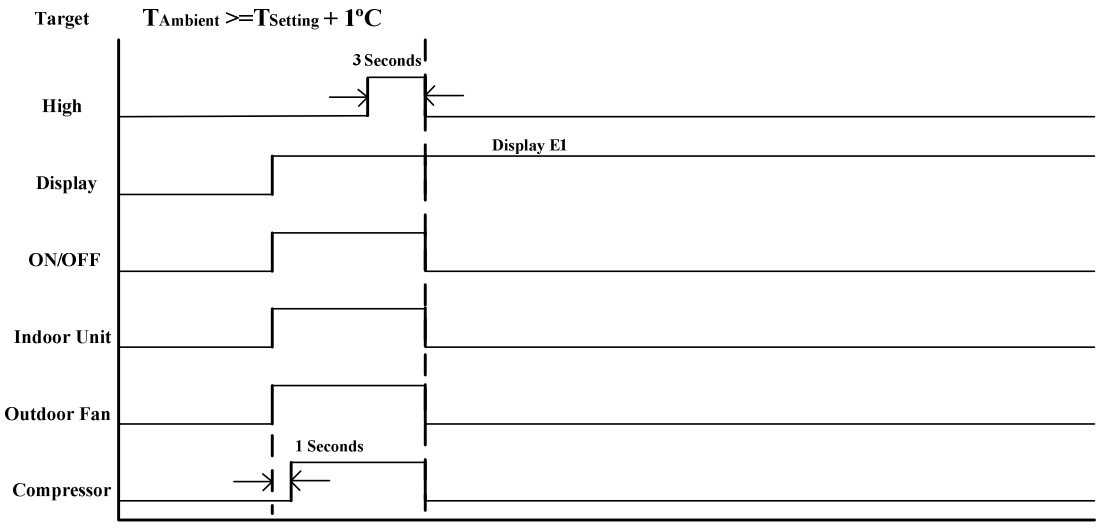
Condition 2: The high pressure temperature of the high pressure sensor equals or is higher than 67.

Time of Detection: 3S

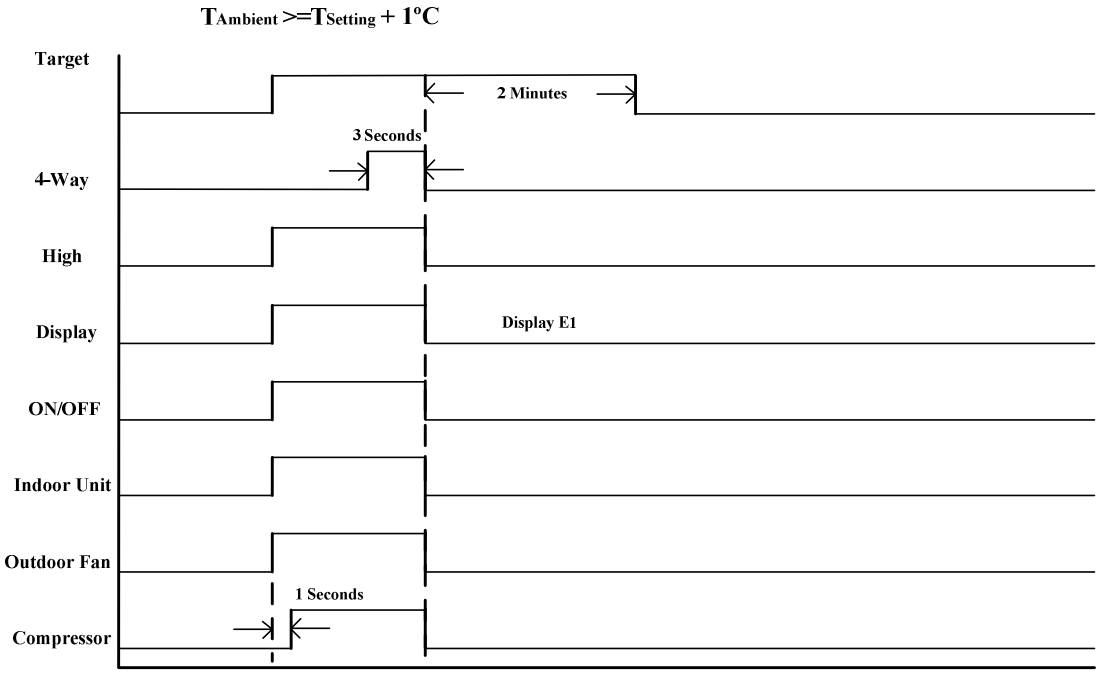
Action after high pressure protection:

The outdoor unit controller stops the compressor and send “Fault” signal to the indoor units to release all load. Now the compressor high pressure protection code E1 is displayed and automatic recovery is not allowed again. Even after the stop protection keeps on for 3 minutes, the unit cannot be restart. Now the user must call serviceman to inspect the air-conditioner. The only way to clear high pressure protection is to de-energize the unit and then restart the unit.

During cooling:



During heating:



B.System Low Pressure Protection

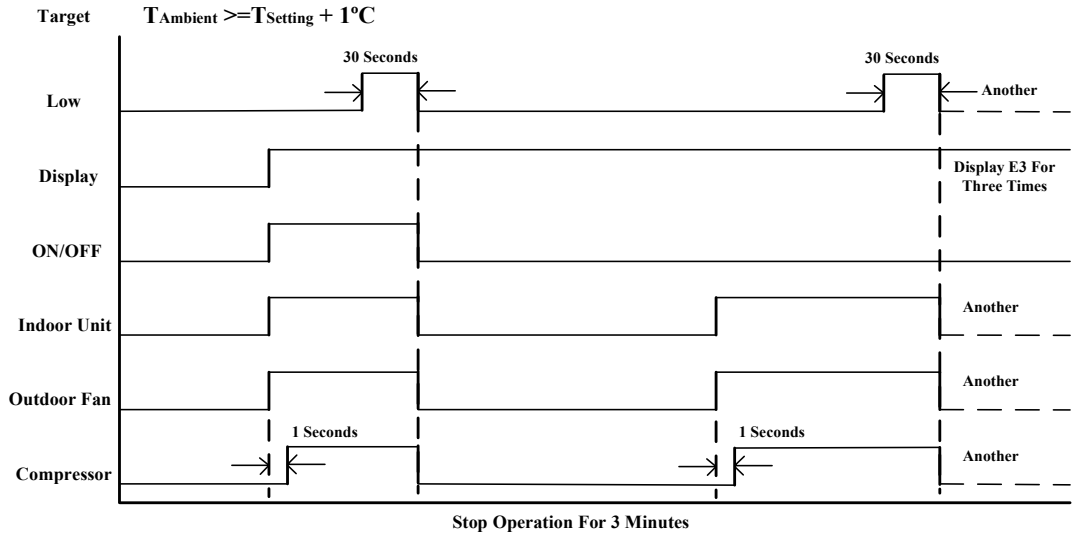
The low pressure detection is not available within 4 minutes after the compressor starts, and during the operation of system oil return and defrosting. Under other circumstances:

Condition 1: When it is detected that the low pressure temperature is lower than -25℃ under any circumstance during cooling, or when it is detected that the low pressure temperature is lower than -32℃ under any circumstance during heating, the protection will start at once, and the low pressure protection will be displayed.

Detection Time: 30S

The low pressure recovery pressure is 0℃, and the unit shall restart after 3 minutes.

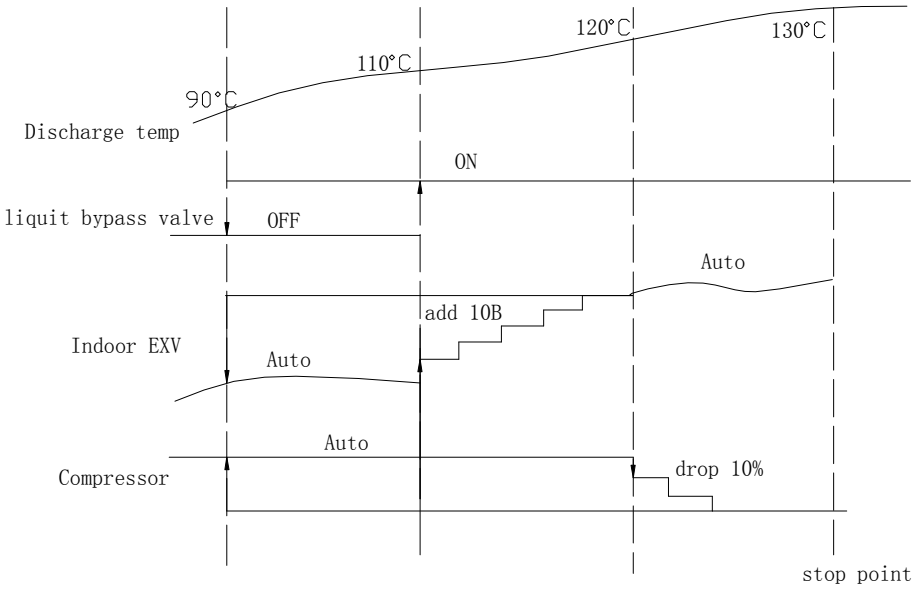
If there are three times of low pressure protection within 1 hour, the outdoor unit must be de-energized and then be energized again to restart.



C. Overcurrent Protection

If it is detected that the current is over the protection-starting value for 3 consecutive seconds when the compressor operates, the compressor will be stopped as the stop condition the same as that when the indoor ambient temperature reaches the set temperature. The compressor shall resume original operating status after stopping for 3 minutes; but if the occurrence of protection is over 6 times (if the operating time of the compressor exceeds 6 minutes, the times of protection will be cleared to zero), the timing indicating light will flicker and the compressor cannot resume to the original operating status.

D.High Temperature Protection of Compressor Exhaust Pipe

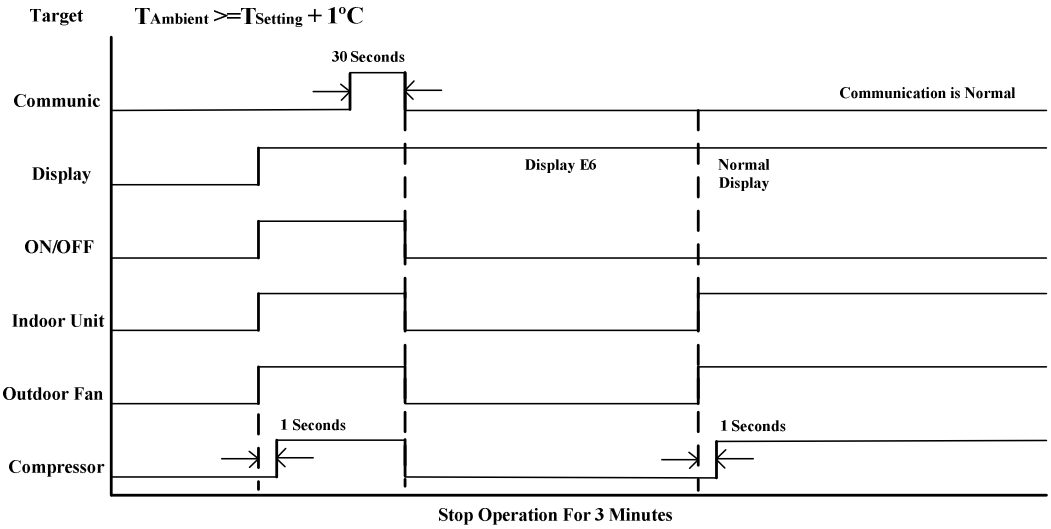


Note :

◆This function of cooling is the same as that of heating. Pay attention that the 4-way valve has a time lag of 2 minutes.

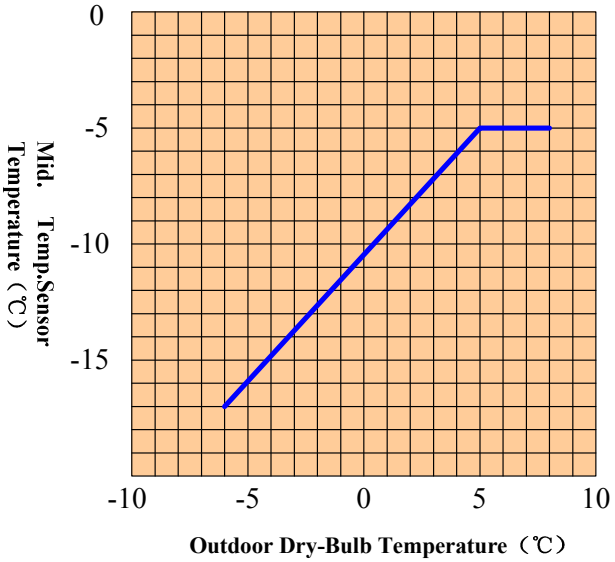
◆Press the ON/OFF key to switch off the unit and to remove the voice alarm. If there is still compressor exhaust protection after the compressor is started, only one detection will be carried out and E4 will be displayed. Now the buzzer sends out alarm (if there is only a receiver, there will be no buzzer alarm function).

E. Communication Failure



5) Defrosting Function

The heating operation continues for 50 minutes (now the 4-way valve is in the heating position); the Mid. Temp.sensor temperature and the outdoor ambient temperature remain below the curve shown in the following chart for 120S.



Or:

The outdoor ambient temperature is lower than -6℃; the heating operation keeps on for 2 hours (now the 4-way valve is in the heating position);

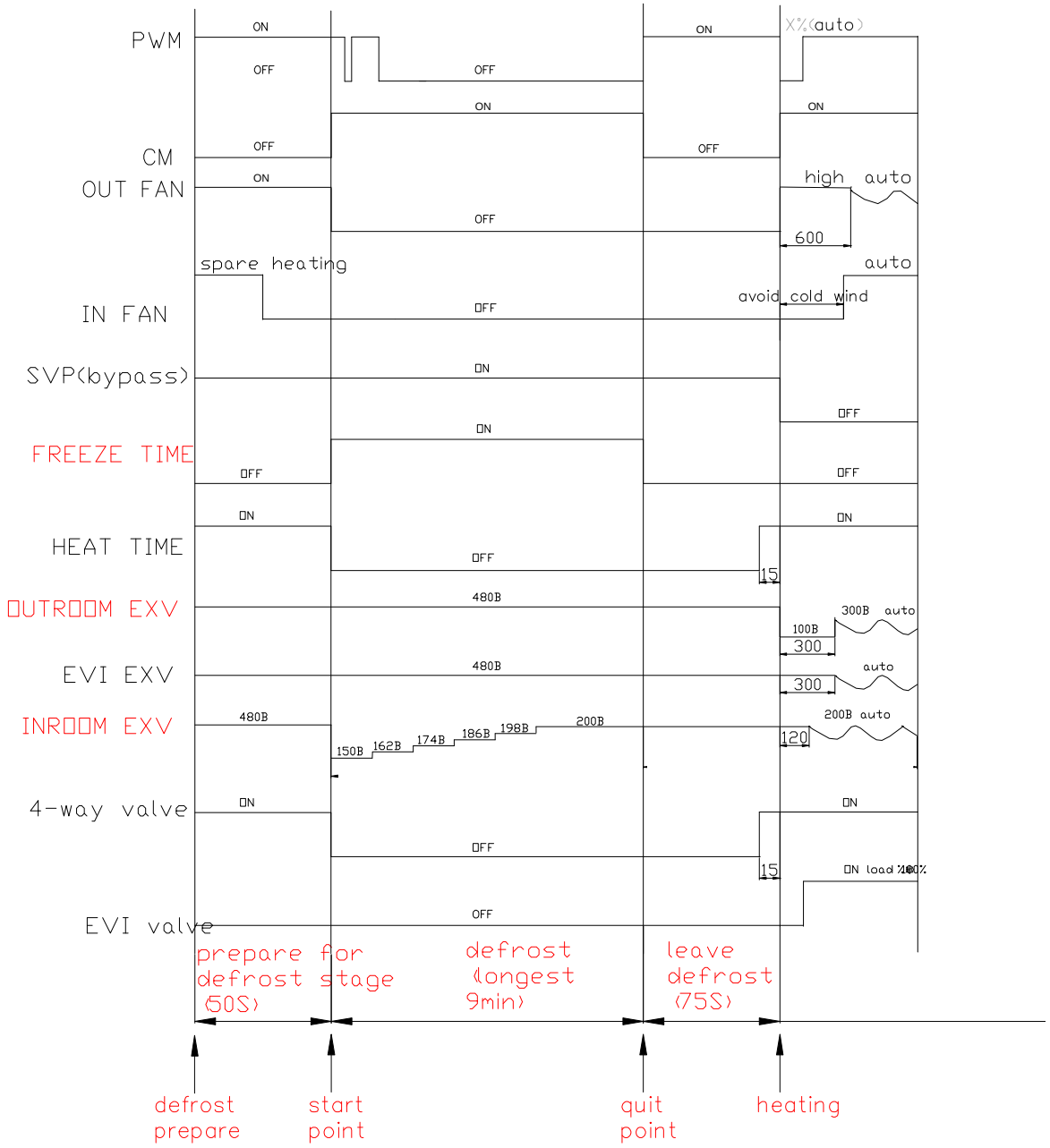
- Condition of stopping defrosting:

  The worm pipe temperature of the outdoor unit is higher than 15℃ or the defrosting operation keeps on for 10 minutes.

- Defrosting Action

  Defrosting is realized by switching the 4-way valve to the cooling mode.

The defrosting process sequence chart of the unit group is shown as follows:


PWM
CM
OUT FAN
IN FAN
SVP(bypass)
FREEZE TIME
HEAT TIME
OUTROOM EXV
EVI EXV
INROOM EXV
4-way valve
EVI valve
ON
OFF
X%(auto)
high auto
600
spare heating
auto
avoid cold wind
15
480B
300B auto
100B
300
200B auto
120
150B 162B 174B 186B 198B 200B
prepare for defrost stage (50S)
defrost (longest 9min)
leave defrost (75S)
defrost prepare
start point
quit point
heating

2.2 Control Function of Indoor Unit

1) Cooling Operation

a) Cooling

According to the capacity demand of the running indoor unit, the outdoor unit decides the frequency under which the compressor runs.

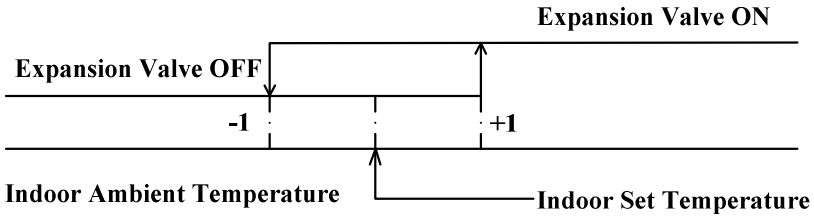
control of the outdoor unit, the indoor unit decides the openness of the electronic expansion valve. The electronic expansion valve is set once every 40 seconds.

b) Temperature Control

Through the openness and close of the indoor electronic expansion valve, the indoor unit realizes the control to the temperature (refer to the following figure).

When the capacity demand of the indoor unit is 0, the electronic expansion valve closes.

When the capacity demand of the indoor unit is not 0, the electronic expansion valve opens.

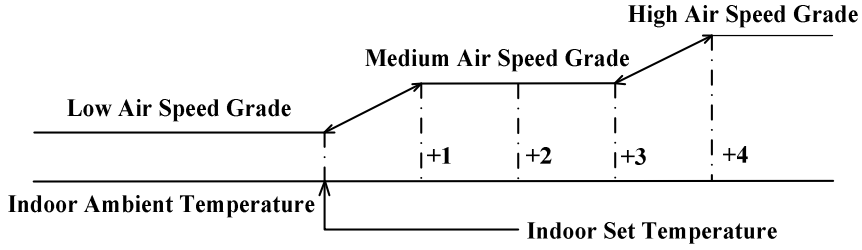


If the indoor units of the same unit group all reach the temperature point, the demand of the unit group is 0, now the outdoor unit shall stop the operation of the compressor and the electronic expansion valve of the indoor unit closes.

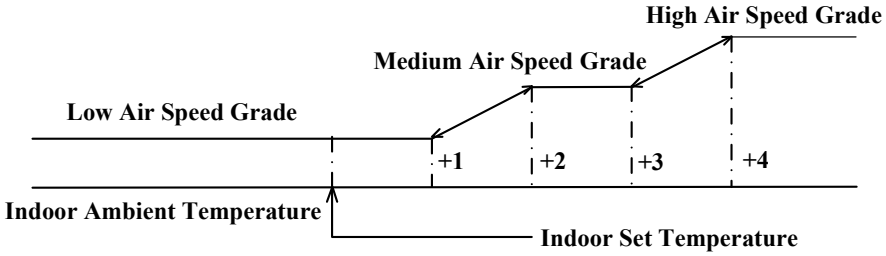
c) Indoor Fan Motor Action

When the indoor unit operates and the fan motor is not set at the automatic air speed grade, the indoor fan motor continue operating at the set air speed whether the capacity demand is 0.

When the indoor fan motor is set at the automatic air speed grade, the fan motor decides the fan motor air speed according to the change of ambient temperature indoors. Refer to the following figure:



Automatic Air Speed Grade For Cooling (General)



Automatic Air Speed Grade For Cooling(Linge Wind)

The switch under the automatic air speed grade is inspected once every 30 seconds.

If the indoor fan motor stops before, the fan motor will start compulsory operation under high air speed grade for 8 seconds and then operates under set air speed.

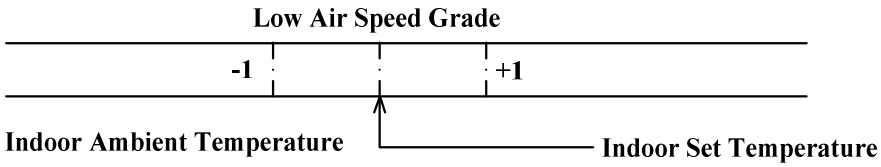
d) Control of Blowing off Residual Cold Air

When the indoor unit stops, the fan motor operates under set air speed or automatic air speed condition for 0-60 seconds.

When the capacity demand of the indoor unit is 0, the electronic expansion valve of the indoor unit closes and the fan motor continue operating under set air speed or automatic air speed condition.

2) Dehumidifying Operation

When the unit operates under the dehumidifying mode, the indoor unit can only operates under the low air speed grade (regardless of the set air speed grade). Other actions are the same as that of the cooling operation. Please refer to the section of cooling operation.



The indoor fan motor stops before, the fan motor will be started to carry out compulsory operation under high air speed grade for 8 seconds and then operates under set air speed.

3) Heating Operation

a) Heating

According to the capacity demand of the running indoor unit, the outdoor unit decides the frequency under which the compressor runs.

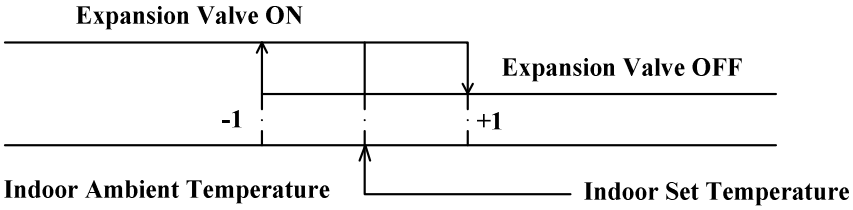
Control of the outdoor unit. The indoor unit decides the openness of the electronic expansion valve. The electronic expansion valve is set once every 40 seconds.

b) Temperature Control

Through the openness and close of the indoor electronic expansion valve, the indoor unit realizes the control of the temperature (refer to the following figure).

When the capacity demand of the indoor unit is 0, the electronic expansion valve closes.

When the capacity demand of the indoor unit is not 0, the electronic expansion valve opens.

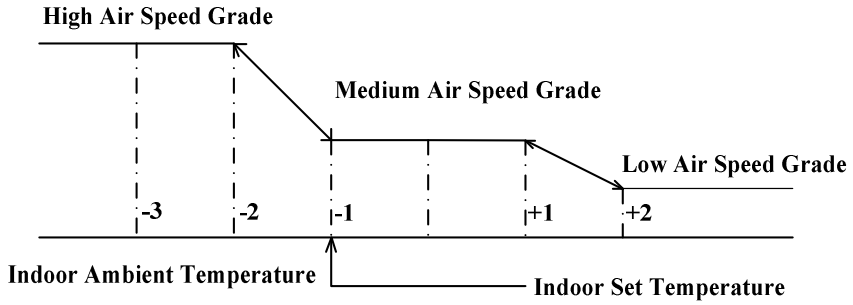


c) Fan Motor Control

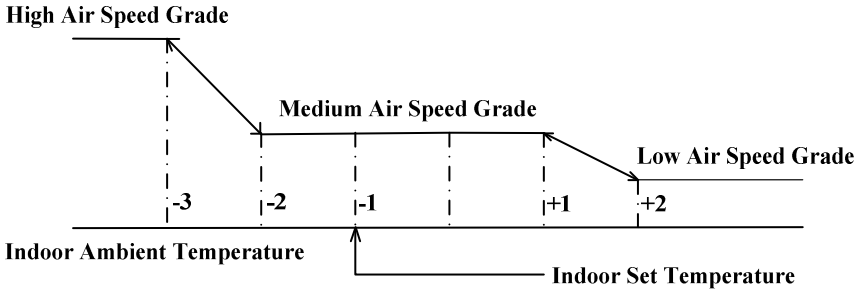
When the indoor unit has capacity demand:

If automatic air speed grade is not set, the fan motor of the indoor unit will operate under set air speed grade；

When the indoor fan motor is set at the automatic air speed grade, the fan motor decides the fan motor air speed according to the change of ambient temperature indoors. Refer to the following figure:



Automatic Air Speed Grade For Heating (General)



Automatic Air Speed Grade For Heating (Linge Wind)

The switch under the automatic air speed grade is inspected once every 30 seconds.

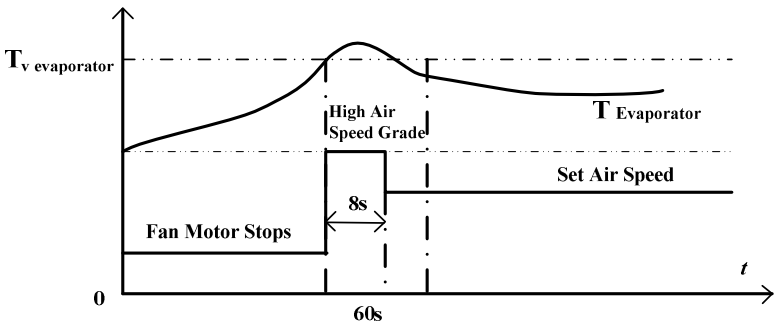
The indoor fan motor stops before, the fan motor will start compulsory operation under high air speed grade for 8 seconds and then operates under set air speed.

d) Operation of Preventing Cold Air

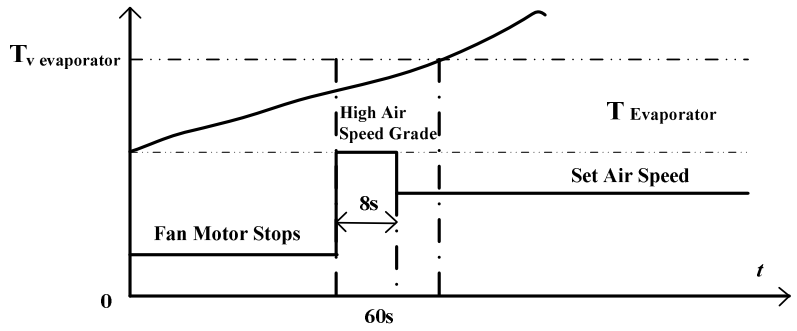
When the indoor unit has capacity demand, the indoor fan motor will be compulsorily turned to close status and operate under the following conditions:

If the evaporator temperature ($t_{evaporator}$) of the indoor unit reaches the threshold $T_{v\ evaporator}$, the indoor fan motor will carry out compulsory operation under high air speed grade for 8 seconds and then operates under set air speed; If the evaporator temperature ($t_{evaporator}$) of the indoor unit still does not reach the threshold $T_{v\ evaporator}$ 1 minute later, the indoor fan motor will carry out compulsory operation under high air speed grade for 8 seconds and then operates under set air speed; Refer to the following figure.

Cold Air Prevention threshold $T_{v\ evaporator}$ Table (℃)	Model	Cassette and Air Duct Series	Wall Mounted Unit Series
	$T_{v\ evaporator}$	35	39



T Evaporator Reaching Threshold Within 1 Minute



T Evaporator Not Reaching Threshold Within 1 Minute

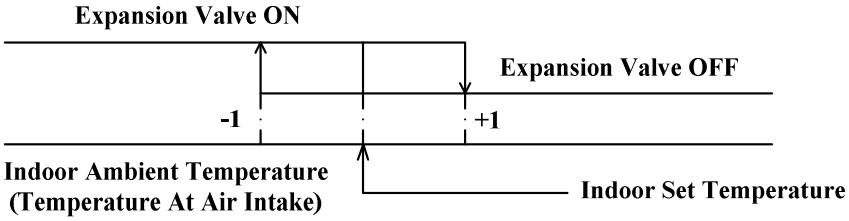
After the indoor unit starts heating operation and the fan motor stops for any reason (including unit starting, defrosting, failure and no demand capacity), the operation of preventing cold air is carried out before the fan motor starts again.

After the indoor fan motor starts, the operation of preventing cold air is not carried out even if the $t_{evaporator}$ is less than the threshold $T_{v\ evaporator}$ again, except the fan motor stops.

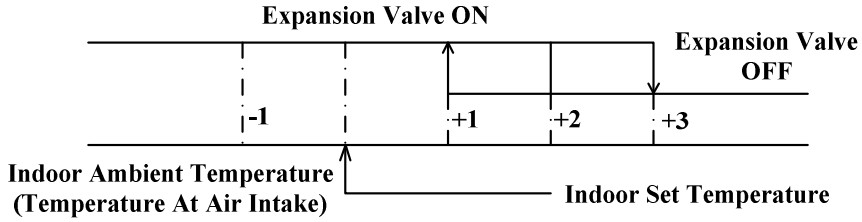
4) Heating Temperature Compensation

When the air-conditioner operates under standard conditions, the unit group adjusts the capacity output of the indoor unit according to the set temperature and the air inlet temperature, so as to adjust the room temperature to the set temperature. If the installation height of the air-conditioner is somewhat high, the hot air tends to rise to the upper space when heating operation is carried out, which is the result of difference of density. Now the temperature of the living space may not reach the set temperature so people may feel uncomfortable.

Therefore, it is required to use the temperature compensation function during heating: the air inlet temperature minus 2℃ is adopted to reflect the real temperature of the living space. Using this method, comfortable temperature will be maintained in the living space.



Temperature Adjustment Under Standard Conditions



Temperature Adjustment With Temperature Compensation

5) Anti-Frosting Control Under Cooling and Dehumidifying Modes

To prevent the frosting as a result of low temperature of the evaporator during the operation of cooling or dehumidifying of the indoor unit from bringing adverse effect to the cooling efficiency, the indoor unit will carry out anti-frosting operation when necessary.

If it is detected that the evaporator inlet pipe temperature T_{Inlet} is $\leq T_{Frosting\ Temperature}$ for $T_{Anti\text{-}frosting}$ minutes after the compressor operates for $T_{Compressor}$ minutes under the modes of cooling or dehumidifying, the anti-frosting

operation will be carried out and now the indoor fan motor and the swing motor remain the original status; When the T_{Inlet} is $\geq T_{Recovery\ Temperature}$, the indicating light is off and the controller will operate under set mode.

The parameters $T_{Compressor}$, $T_{Anti\text{-}frosting}$, $T_{Frosting\ Temperature}$,and $T_{Recovery\ Temperature}$are different for different unit models. Refer to the following table:

Unit Model	$T_{Compressor}$（m）	$T_{Anti\text{-}frosting}$（m）	$T_{Frosting\ Temperature}$（℃）	$T_{Recovery\ Temperature}$（℃）
Duct Cassette Series	15	10	-4	15
Wall Mount Series	6	3	0	10

6) Automatic Swing Control

The wall mount series and the cassette series indoor units have swing function. Using swing function can increase air convection indoors to increase the uniformity of the indoor temperature.

◆Reset

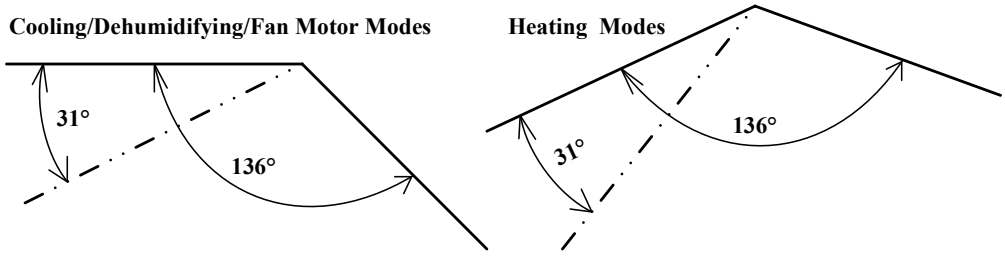
When the unit is powered on for the first time, the swing louvers will swing automatically once to let the swing louver return to the initial position, thus the correctness of the swing louver action is ensured.

◆Using the keys on the indoor unit to turn on the unit

When using the keys on the indoor unit to turn on the unit, the default automatic swing will be started and the swing louvers swing back and forth from the maximum location and the minimum location (for different modes, the maximum locations and the minimum locations are different).

◆Using wire controller or remote controller to control

When using the wire controller or the remote controller to turn on the unit and the automatic swing signal is not set then, the swing louvers will stop at the default position when the unit is turned on (for different modes, the default locations are different). If the automatic swing signal is set when the unit is turned on, the automatic swing will be started and the swing louvers swing back and forth from the maximum location and the minimum location (for different modes, the maximum locations and the minimum locations are different).



When the wire controller or the remote controller sends the signal of automatic swing, the indoor unit will start automatic swing and the swing louvers will start to swing from the current location.

When the wire controller or the remote controller sends the signal of stopping automatic swing, the indoor unit will stop automatic swing operation and the swing louvers will stop at the current location.

◆Others

When the indoor unit receives the signal of switching-off, detects the failure signals other than the auxiliary electrical heating protection signal, and detects the defrosting signal, the indoor unit, regardless of which state the swing louvers are in, will stop to return to the initial position after the indoor fan motor stops.

When the indoor unit detects the auxiliary electrical heating protection signal, the automatic swing will start regardless of which state the indoor unit is in, and the indoor fan motor will operate under high speed.

7) Drainage Pump Motor Control

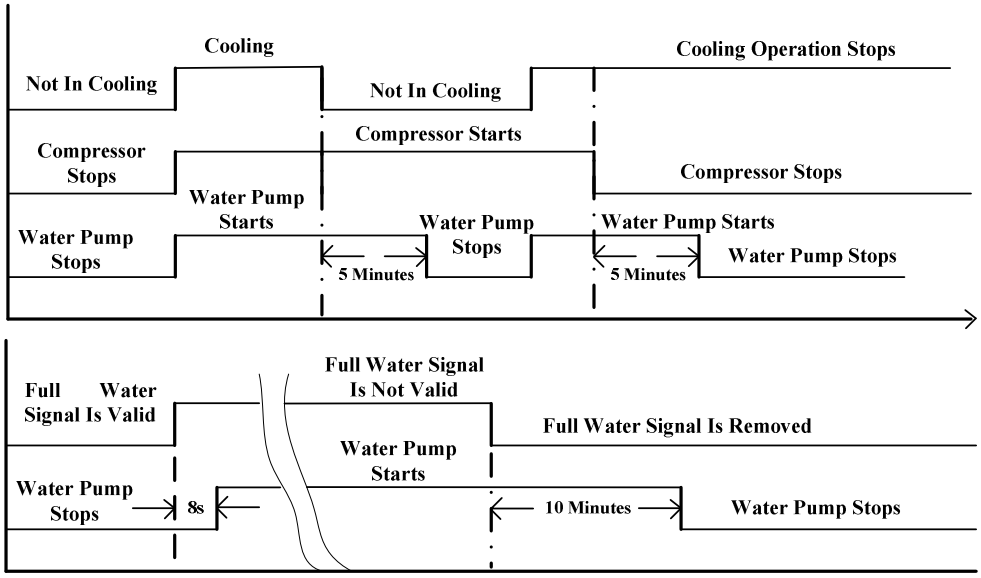
The cassette series indoor unit is equipped with the drainage pump which can drain the condensate water

produced during the cooling or the dehumidifying operation.

◆When the indoor unit carries out cooling or dehumidifying operation, the water pump and the compressor starts simultaneously.

◆When the unit is turned off or the cooling operation is stopped, or when the dehumidifying operation is stopped or the unit turns to other mode, the power supply to the water pump will only be cut off 5 minutes later.

◆When it is detected that the water level overflows for 8 seconds regardless of which mode (including switching-off of unit) the unit is in, the water pump will start immediately and will not stop if the signal of water level overflow is not removed; But the water pump will continue operating for 10 minutes further after the signal of water level overflow is removed.



8) Electronic Expansion Valve Control

A. Reset Control of Indoor Electronic Expansion Valve

When the indoor unit is powered on, the indoor unit will automatically carry out the reset of the electronic expansion valve, so that the valve return to the initial position to ensure the correctness of the action of the valve.

B. Control of Superheat Degree During Cooling Operation

During the process of cooling or dehumidifying, the unit group shall control the open degree of the electronic expansion valve of the indoor unit according to the fact that how the difference between the inlet temperature and the outlet temperature is deviated from the set superheat degree. The purpose is to keep proper superheat degree and the detection is carried out every 40 seconds. When the unit is turned off, the operation of the unit is stopped when the set temperature is reached, or there is any failure, this control process is ended.

C. Control of Subcooling Degree During Heating Operation

During the process of heating, the unit group shall control the open degree of the electronic expansion valve of the indoor unit according to the fact that how the difference between the inlet temperature and the outlet temperature is deviated from the set superheat degree. The purpose is to keep proper subcooling degree and the detection is carried out every 40 seconds. When the unit is turned off, the operation of the unit is stopped when the set temperature is reached, there is any failure or defrosting is carried out, this control process is ended.

9) Sensor Inspection Control

◆Ambient Temp. Sensor

When it is detected that the ambient temperature is continuously lower than -20℃ for 1 minute or is continuously higher than 100℃ for 1 minutes, the signal of ambient temp. sensor failure (failure code: F0) is sent and the indoor unit stops operation because of abnormality.

If it is detected that the ambient temperature is continuously larger than -20℃ but lower than 100℃ for 1 minute under the status of ambient temp. sensor failure, the signal of ambient temp. sensor failure is removed and the indoor unit resumes the original operating status.

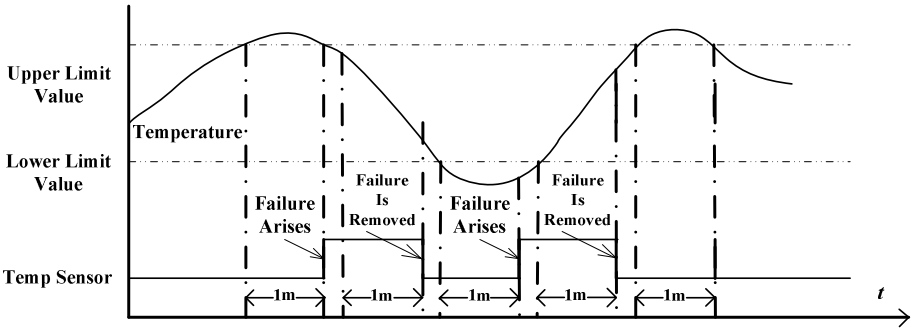
◆Evaporator Tube Temp. Sensor

When it is detected that the evaporator tube temperature is continuously lower than -30℃ for 1 minute or is continuously higher than 100℃ for 1 minutes, the signal of evaporator tube temp. sensor failure is sent and the indoor unit stops operation because of the abnormality.

If it is detected that the evaporator tube temperature is continuously larger than -20℃ but lower than 100℃ for 1 minute under the status of evaporator tube temp. sensor failure, the signal of evaporator tube temp. sensor failure is removed and the indoor unit resumes the original operating status.

◆All the detection time is not counted.

Failure Type	Failure Code
Indoor Ambient Temp. Sensor Failure	F0
Indoor Inlet Pipe Temp. Sensor Failure	F1
Indoor Intermediate Pipe Temp. Sensor Failure	F2
Indoor Outlet Pipe Temp. Sensor Failure	F2



10) Address Code Setting

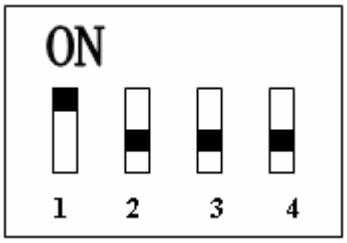
Each indoor unit of the same group can only operate normally if it is assigned only one address. Therefore, the address of the indoor units must be set properly.

Different indoor units of the same group must have different address.

Each group of indoor units has 16 different addresses at most.

The address of every indoor unit must be identical with the address of the corresponding wire controller.

Use the address DIP switches to set the addresses for the indoor units and the wire controller. The DIP switches are located at the main boards of the indoor unit and the wire controller and have be marked with “Address”.



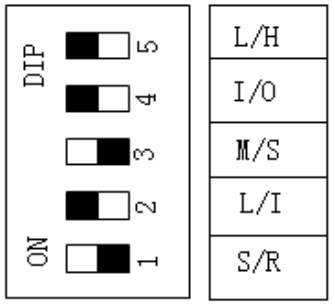
Refer to the following table for the addresses designated by the DIP switch position status combinations.

DIP Switch Position Status Combinations (4-position DIP Switch)				
Position 4	**Position 3**	**Position 2**	**Position 1**	**Address Designation**
ON	ON	ON	ON	1
ON	ON	ON	OFF	2
ON	ON	OFF	ON	3
ON	ON	OFF	OFF	4
ON	OFF	ON	ON	5
ON	OFF	ON	OFF	6
ON	OFF	OFF	ON	7
ON	OFF	OFF	OFF	8
OFF	ON	ON	ON	9
OFF	ON	ON	OFF	10
OFF	ON	OFF	ON	11
OFF	ON	OFF	OFF	12
OFF	OFF	ON	ON	13
OFF	OFF	ON	OFF	14
OFF	OFF	OFF	ON	15
OFF	OFF	OFF	OFF	16

11) Function Code Setting

☆ Before power on of the main board, 4-bit dial switch must be set to decide running status of indoor unit.

☆ Function description is as below:



The DIP switch setting showed in above illustration is the default setting after manufactured.

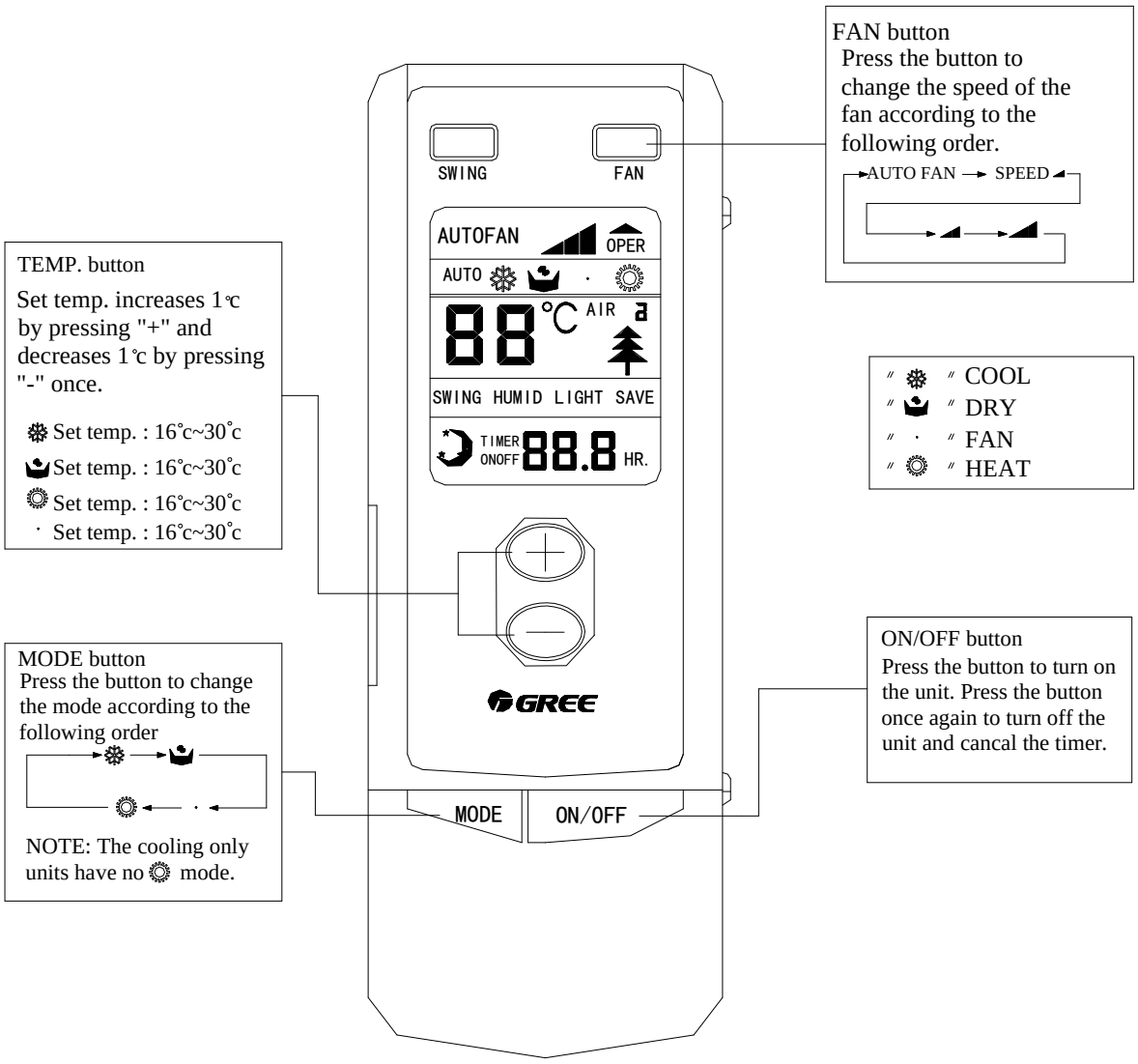
Dial switch Silk-screen	**Function description**	**Dial ON**	**Dial OFF**
1（S/R）	Selection of memory mode: A. Selection between recovery mode after power on and standby mode after power on B. This function is effective without wired controller.	Standby after power on	Recovery after power on
2（L/I）	Selection between receiver and manual controller: A. If manual controller is selected; remote-control function of receiver will be shielded. B .If receiver is selected, manual controller will be ineffective.	Select wired controller to operate	Select receiver to operate
3（M/S）	Setting of master unit and slave indoor unit	Master unit	Slave unit

	A. Used to solve modes conflict B. This function is effective without wired controller.		
4（I/O）	Selection of ambient temp. sensor: A. selection between ambient temp. sensor (T amb.) of main board and ambient temp. sensor (T amb.1) of receiver This function is effective without wired controller.	Select ambient temp. sensor of main board	Select ambient temp. sensor of receiver
5（L/H）	Select to choose high E.S.P or low E.S.P fan speed	Select low E.S.P fan speed	Select high E.S.P fan speed

3 WIRELESS REMOTE CONTROLLER

⚠ NOTE!

- Make sure that there is no obstruction between the remote control and the signal receptor.
- The remote control signal can be received at the distance of up to about 10m.
- Don't drop or throw the remote control.
- Don't let any liquid flow into the remote control.
- Don't put the remote control directly under the sunlight or any place where is very hot.

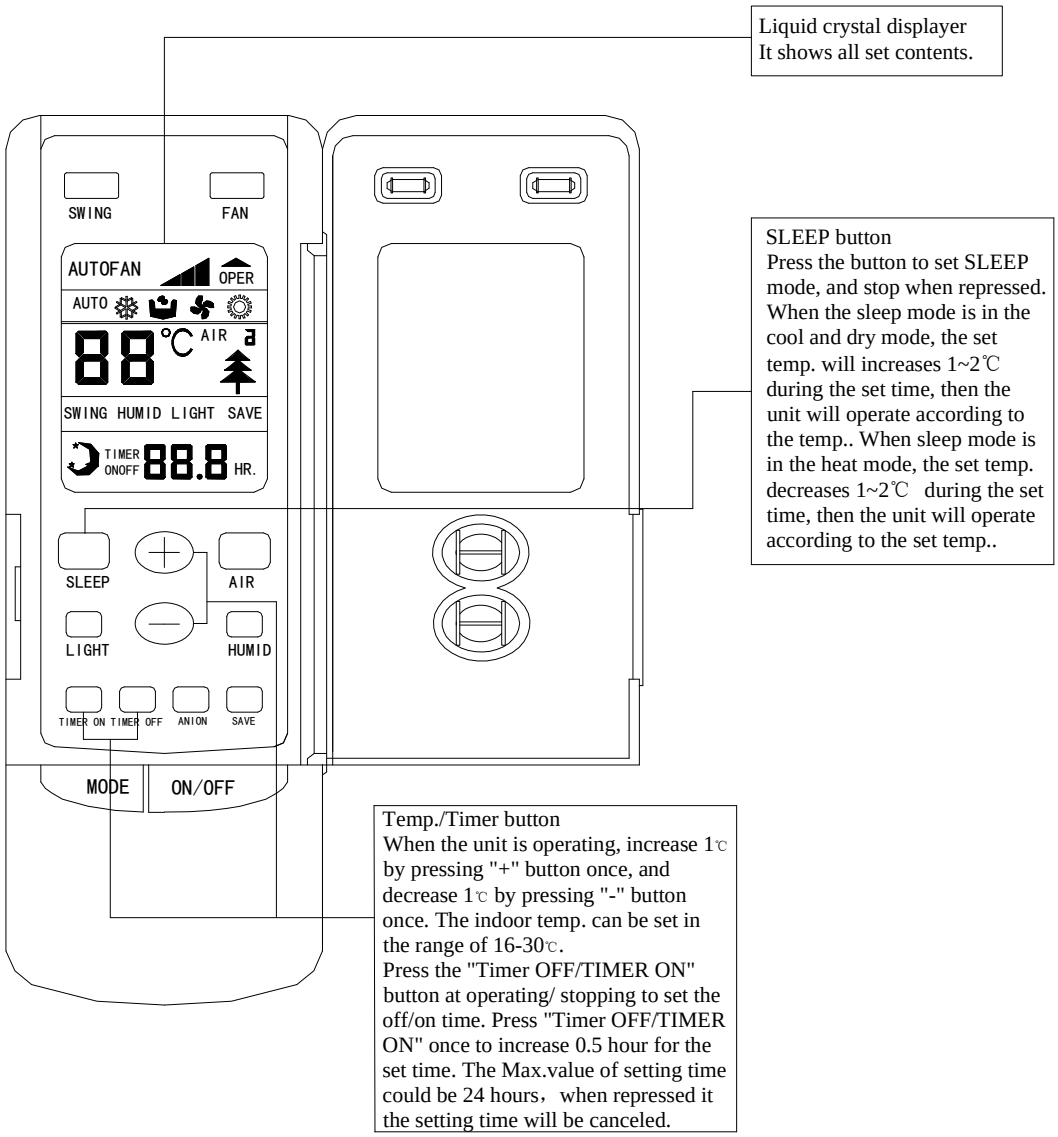

FAN button
Press the button to change the speed of the fan according to the following order.
AUTO FAN → SPEED
TEMP. button
Set temp. increases 1℃ by pressing "+" and decreases 1℃ by pressing "-" once.
Set temp. : 16℃~30℃
Set temp. : 16℃~30℃
Set temp. : 16℃~30℃
Set temp. : 16℃~30℃
〃 〃 COOL
〃 〃 DRY
〃 〃 FAN
〃 〃 HEAT
MODE button
Press the button to change the mode according to the following order
NOTE: The cooling only units have no mode.
ON/OFF button
Press the button to turn on the unit. Press the button once again to turn off the unit and cancal the timer.
SWING
FAN
AUTOFAN
OPER
AUTO
AIR
SWING HUMID LIGHT SAVE
TIMER ONOFF
HR.
GREE
MODE
ON/OFF

⚠ NOTE!

After every indoor unit received the turn off signal, the fan and electric inflate valve will continue to work for 20-70mins to make use of the rest cool or rest heat, while for preparation for the nest work. And this is normal phenomenon.

NOTE!

This type of remote control is a kind of general use remote control that is suitable for several types (function) of air conditioner units. Please understand that the functions and buttons that are not suitable for this air conditioner will not be introduced.


Liquid crystal displayer
It shows all set contents.
SLEEP button
Press the button to set SLEEP mode, and stop when repressed. When the sleep mode is in the cool and dry mode, the set temp. will increases 1~2℃ during the set time, then the unit will operate according to the temp.. When sleep mode is in the heat mode, the set temp. decreases 1~2℃ during the set time, then the unit will operate according to the set temp..
Temp./Timer button
When the unit is operating, increase 1℃ by pressing "+" button once, and decrease 1℃ by pressing "-" button once. The indoor temp. can be set in the range of 16-30℃.
Press the "Timer OFF/TIMER ON" button at operating/ stopping to set the off/on time. Press "Timer OFF/TIMER ON" once to increase 0.5 hour for the set time. The Max.value of setting time could be 24 hours， when repressed it the setting time will be canceled.
SWING
FAN
AUTOFAN
OPER
AUTO
AIR
SWING HUMID LIGHT SAVE
TIMER ONOFF
HR.
SLEEP
AIR
LIGHT
HUMID
TIMER ON
TIMER OFF
ANION
SAVE
MODE
ON/OFF

Operation procedure

Normal procedure

1. Press ON/OFF button after energization, then the unit is operating.
2. Press MODE button to choose the need operation mode.
3. Press FAN button to set the fan speed.
4. Press +/- button to set the need temp.

Selectable procedure

5. Press SLEEP mode to set the sleep state.
6. Press TIMER OFF button to set the set time.

Note: When the operating mode selected by the indoor unit clashes with the one selected by the outdoor unit, the remote controller will display the operating clash after 5 seconds and the power light will flicker, then the indoor unit turns off. At this time, the units will become normal after the

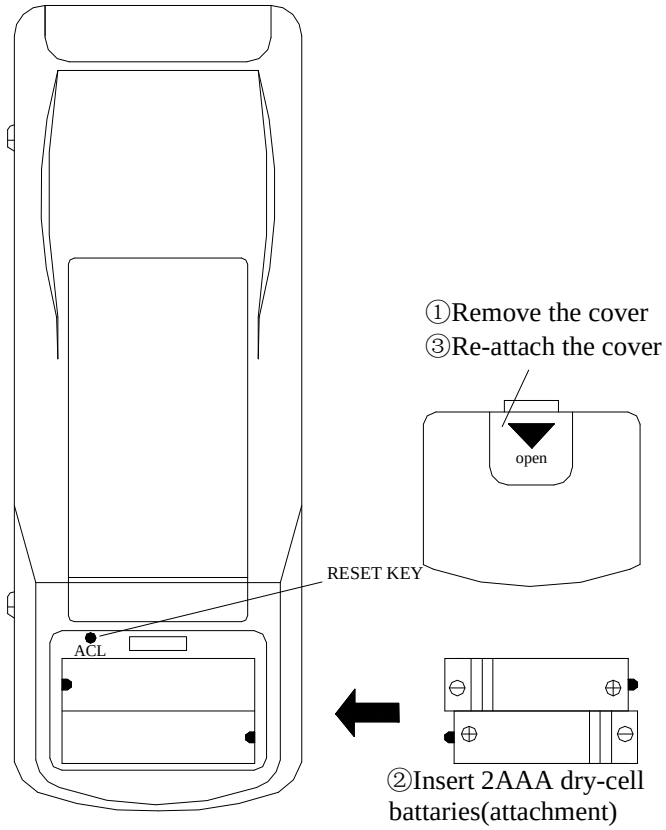
operating mode of the indoor unit is changed to cooperate with the outdoor unit. Cool mode can cooperate with dry mode, and fan mode can cooperate with any mode.

How to insert batteries

Two batteries (Two AAA dry-cell batteries) are used by the remote control

1. Remote the cover from the back of the remote control downward, take out the worn batteries and insert two new ones (Make sure the two poles are correct)

2. Re-attach the cover.



1.All the prints and code no. will be showed on the displayer after the insert of batteries. The remote control can be operated after 10sec.
2.The lifetime of the batteries is about one year.
3.Don't confuse the new and worn or different types of batteries.
4.Remove batteries when the remote control is not in use for a longtime to avoid mal-function caused by liquid leakage.
5.The remote control should be placed about 1m or more from the TV set or any other electric appliances.
6.The remote control should be used in the receivable range (the reception range is 10m)
7.When the remote control can not be controlled in the situation of inserted batteries, please remove the back cover and press "ACL" button to make it normal.

4 WIRED REMOTE CONTROLLER

4.1 Operation and Display View

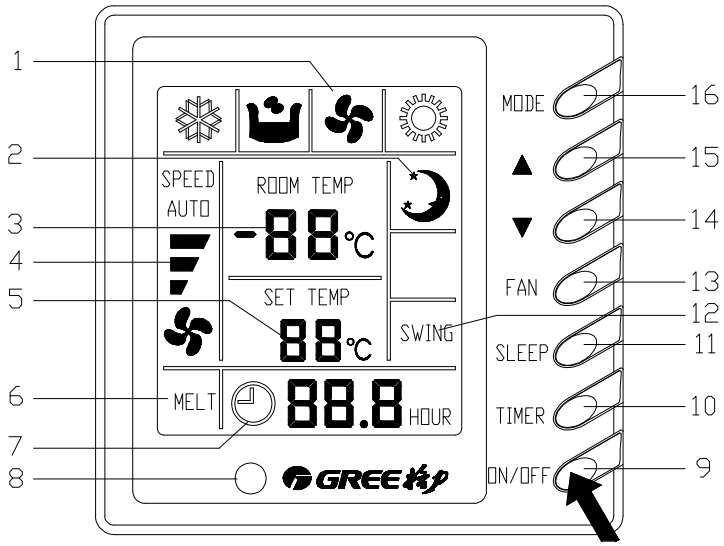


Fig.4.1

Various Components of Wired Remote Controller			
1	Operating mode display (Cool, Dry, Fan, Heat)	9	On/Off button
2	Sleep mode display	10	Timer button
3	Environmental temp. display /Malfunction display	11	Sleep button
4	Fan control display (automatic, high, media, low)	12	Swing display
5	Set Temp. display	13	Fan control button
6	Defrosting display	14	Temp./ Timer decrease button
7	Timer display	15	Temp./ Timer increase button
8	Signal receptor	16	Mode button

4.2 Dimension

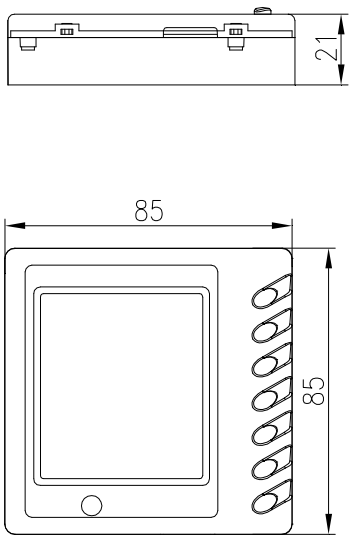


Fig.4.3.1 Outline Demension of Wired Controller

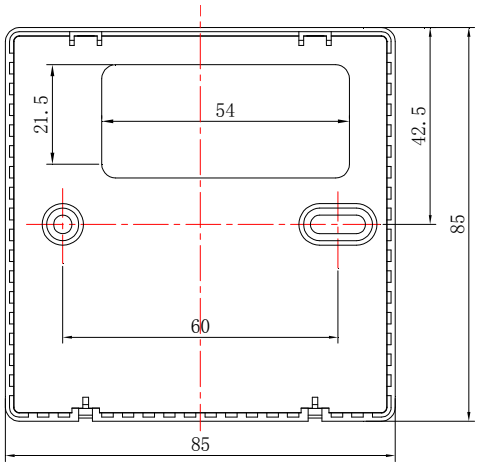


Fig.4.3.2 Installation Demension of Wired Controller

4.3 Installation

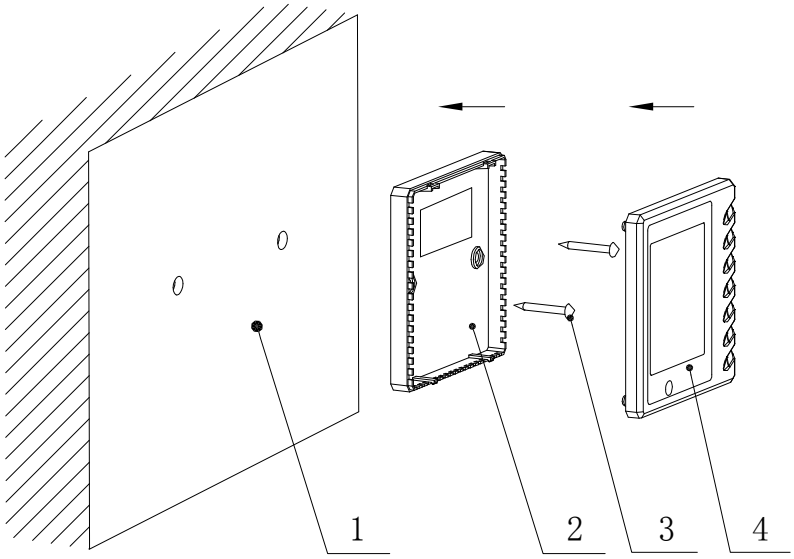


Fig.4.3 Installation of wire remote controller

SN	1	2	3	4
Name	Casing base, installed into the wall	Controller Soleplate	Screw M4X25	Controller Panel

● Notice for installation under the guidance of Fig.10

1. Cut off power supply before installing the electrical components, it is forbidden to carry out the installation with power on;

2. Get one end of the 4 core communication cable, put it through the rectangular hole on the base board of the wire remote controller;

3. hold the base board of controller on the wall, then fix it to the wall with M4x25 screw;

4. Plug the 4 core communication cable into the slot on the wired remote controller, then fix the controller panel with base board together;

5 Mini Centralized CONTROLLER

5.1 Function

Region monitoring control and region wired control are the two main control functions for mini centralized controller (region controller).

Region monitoring controller can monitor or control 16 indoor units of a group for inquiry and single or centralized control.

Region wired controller can replace 1-16 selected wired controllers to uniformly set or control the indoor units.

Refer to Fig.1.1, Fig.1.2 about the Sketch map to the relation among the mini centralized controller (region controller), region monitoring controller and region wired controller.

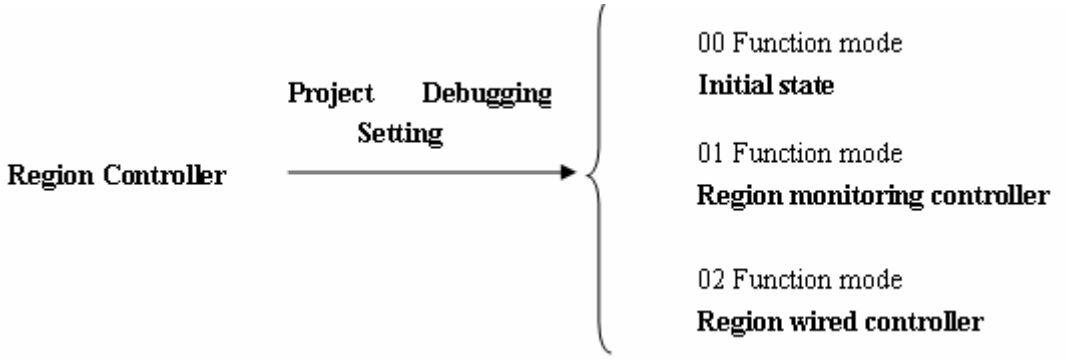


Fig.1.1

Before using, the controller functions must be selected by the personnel who perform the installation according to the requirements of users. Please refer to **Project Debugging Setting** section for the details.

Note: If the controller is set to be region wired controller, the wired controller of the selected indoor unit must be removed.

The mini centralized controller (region controller) can be matched with long-distance monitor. As a region monitoring controller, its control is subject to that of the long-distance monitor. In the same group, one of the mini centralized controller (region controllers) can be used as region monitoring controller and matches one or more region wired controller which replace(s) one or more wired controller, in which case, the region monitoring controller can also monitor or control the region wired controller.

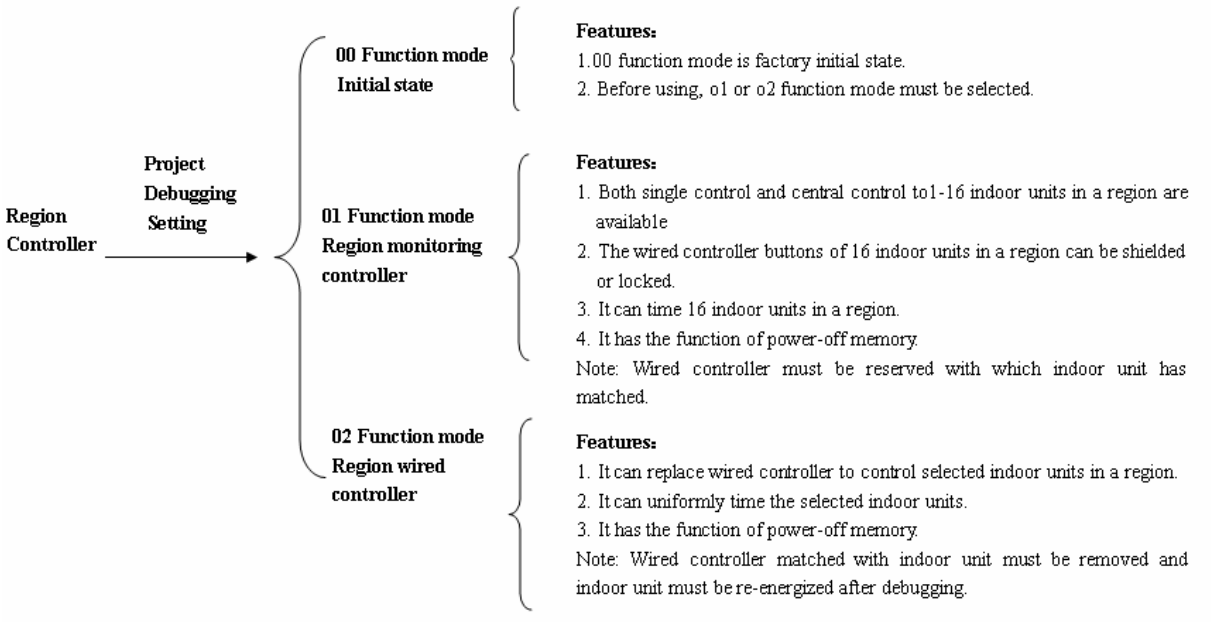
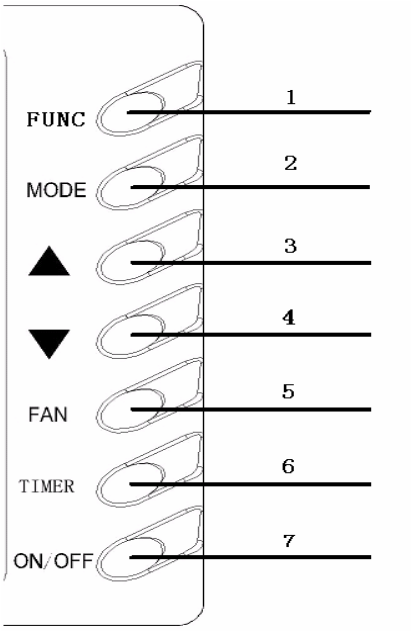

Region Controller
Project Debugging Setting
00 Function mode
Initial state
Features:
1.00 function mode is factory initial state.
2. Before using, o1 or o2 function mode must be selected.
01 Function mode
Region monitoring controller
Features:
1. Both single control and central control to1-16 indoor units in a region are available
2. The wired controller buttons of 16 indoor units in a region can be shielded or locked.
3. It can time 16 indoor units in a region.
4. It has the function of power-off memory.
Note: Wired controller must be reserved with which indoor unit has matched.
02 Function mode
Region wired controller
Features:
1. It can replace wired controller to control selected indoor units in a region.
2. It can uniformly time the selected indoor units.
3. It has the function of power-off memory.
Note: Wired controller matched with indoor unit must be removed and indoor unit must be re-energized after debugging.

Fig.1.2 Sketch map to the relation among the mini centralized controller (region controller), region monitoring controller and region wired controller

5.2 Operation View



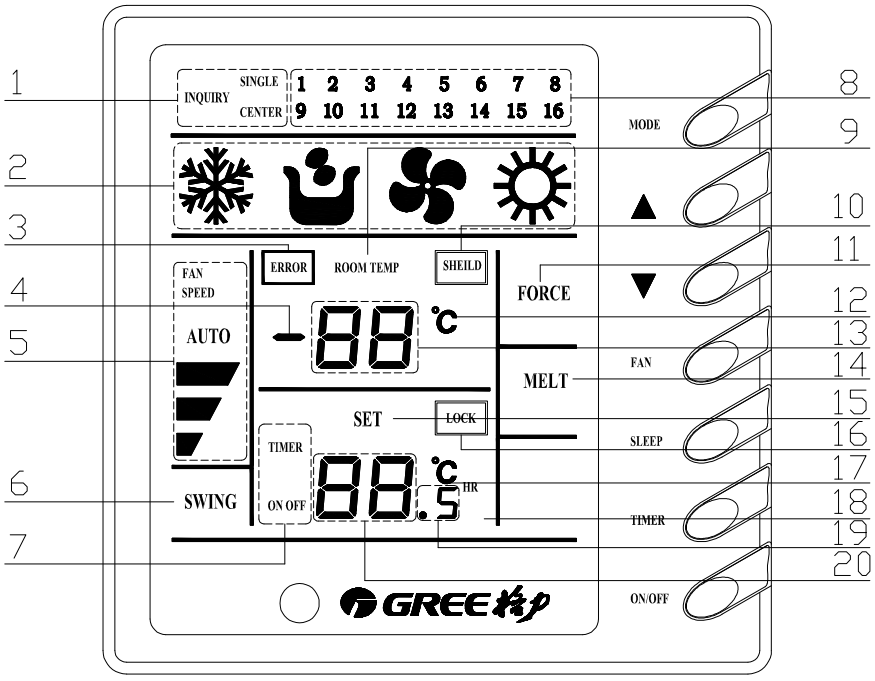
（Fig.5.2）

Instruction to functions of buttons (Table 5.1)

No.	Name	Function
1	FUNC (FUNCTION)	A. Switch the control mode of inquiry/single/ central control. B. In central control status, give the central order by successively pressing FUNC button.
2	MODE	Set cooling/heating/fan/dry mode for indoor unit
3	▲	A. Inquiry status: cycle, increase or decrease No. of indoor units to easily inquire the status of each indoor unit. B. Single/Central control status: set running temp. of indoor unit, maximum is 30℃ and minimum is 16℃. C. Timer setting status: increase or decrease the timer on/off time, maximum is 24hr and minimum is 0.
4	▼	
5	FAN	A. Set the indoor fan speed of hi/mid/low/auto. B. Successively press FAN button to set on/off swing.
6	TIMER	A. Under single/central control mode, set on /off timer of selected indoor unit B. Under inquiry status, inquire the timer setting of the indoor unit with current address.
7	ON/OFF	Set ON/OFF of the indoor unit.
2MODE and 7 ON/OFF	Lock	Under single/central control, press MODE and ON/OFF buttons simultaneously to start/ stop the lock of operation to buttons of wired controller for selected indoor units.
2MODE and 6 TIMER	Shield mode	Under single/central control, press MODE and TIMER simultaneously to start/ stop the shield of operation to MODE button of wired controller for selected indoor unit.
4 ▼and 6 TIMER	Shielding Temp.	Under single/central control, press ▼ and TIMER simultaneously to start/ stop the shield of operation to Temp button of wired controller for selected indoor unit.
7 ON/OFF and 6 TIMER	Shielding ON/OFF	Under single/central control, press ON/OFF and TIMER simultaneously to start/ stop the shield of operation to ON/OFF button of wired controller for selected indoor unit.

2 MODE and 3 ▲	Memory mode	Refer to **power-off memory function** about the details.
4 ▼and 7 ON/OFF	Selection of function	A. Check the control mode of region monitoring controller / region wired controller B. Set the control mode of region monitoring controller / region wired controller
Note: 1.The characters with gray back ground indicate buttons. Following part is the same to it. 2. The time of single press of the button is more than 3s, which means successively-press. 3. There isn‘t the function that the region wired controller shields other indoor wired controller.		

5.3 Display View



(Fig.5.3)

No.	Display name	Instruction to display
1	Control mode	Inquiry state, “INQUIRY” is displayed. Single control state,”SINGLE” is displayed. Centralized control state, “CENTER” is displayed.
2	Running mode	Each indoor unit running mode is displayed.
3	Error	“ERROR” is displayed during any malfunction to indoor or outdoor unit in a group.
4	—	“— “ is displayed when there is no malfunction to selected indoor unit and the ambient temp. is below zero.
5	Fan speed display	Hi, mid, low or auto speed of indoor fan is displayed.
6	Swing	Swing running of indoor unit is displayed.
7	Timer	“TIMER ON/OFF” is displayed when setting timer or inquiring timer state.
8	No. of indoor unit	Under inquiry state, No. of online indoor units are displayed and No. of selected indoor unit will blink. Under single control state, only No. of selected indoor unit is displayed.

		Under centralized state, No. of all online indoor units are displayed.
9	Room temp.	“ROOMTEMP” is displayed for no malfunction, but isn’t for malfunction.
10	Shield	Centralized controller A. Under inquiry state,” SHIELD” will be displayed when selected indoor unit is shielded. B. Under control state,” SHIELD” will be displayed during setting or giving the shield order. Region wired controller:” SHIELD” will be displayed when selected units are shielded during long-distance monitoring.
11	Force	“FORCE” is displayed when indoor unit is forced to run.
12	℃ (room temp.)	“ ℃” is displayed when there is no malfunction.
13	Room temp. or error code	Room temp. value is displayed during no malfunction to selected indoor or outdoor unit. Error code is displayed during malfunction to selected indoor or outdoor unit.
14	Melt	“Melt” is displayed during defrosting.
15	Lock	Region monitoring controller A: Inquiry state: “LOCK” is displayed when selected indoor unit is locked. B: Control state: “LOCK” is displayed during setting or giving the lock order. Region wired controller: “LOCK” is displayed when selected unit is locked in long-distance monitoring.
16	Set	“SET” blinks when the unit is on and commanded. “SET” is displayed when the unit is on without command.
17	℃ (set temp.)	Set temp. value is displayed when the selected indoor unit is on and not in timer inquiry or setting status.
18	HR (hour)	“HR” is displayed during timer inquiry or setting.
19	.5	“.5” is displayed when the timer time value includes 0.5 hr and the unit is during timer inquiry or setting.
20	Setting temp. and timer time	During timer inquiry, integer of setting time of timer is displayed. During timer setting, integer of setting time of timer is displayed. Set temp. value is displayed when the unit is not during timer inquiry or setting.

Note:

1. Contents in the double quotation marks indicate the display in LCD. Following part is the same to it.
2. Online indoor units to Mini Centralized Controller indicate that in a region. Following part is the same to it.
3. No signal control function for region wired controller, and “SINGLE” won’t be displayed either.

5.4 Connection Between Controller and Unit

Insert the 4-core twisted pair line to wired controller. If it is with the indoor unit, insert it into mini centralized controller (region controller) wiring terminal CN1 (or CN2), and then connect the other wiring terminal CN2 (or CN1) with the main board of indoor unit.

If there is no wired controller with indoor unit, introduce a 4-core twisted pair line to indoor unit main board and connect it with mini centralized controller (region controller) wiring terminal CN1 (or CN2).

Note： Any main board of the indoor unit controlled by the mini centralized controller (region controller) can be connected. If the mini centralized controller (region controller) is used as a region wired controller, wired controller with the indoor unit must be removed.

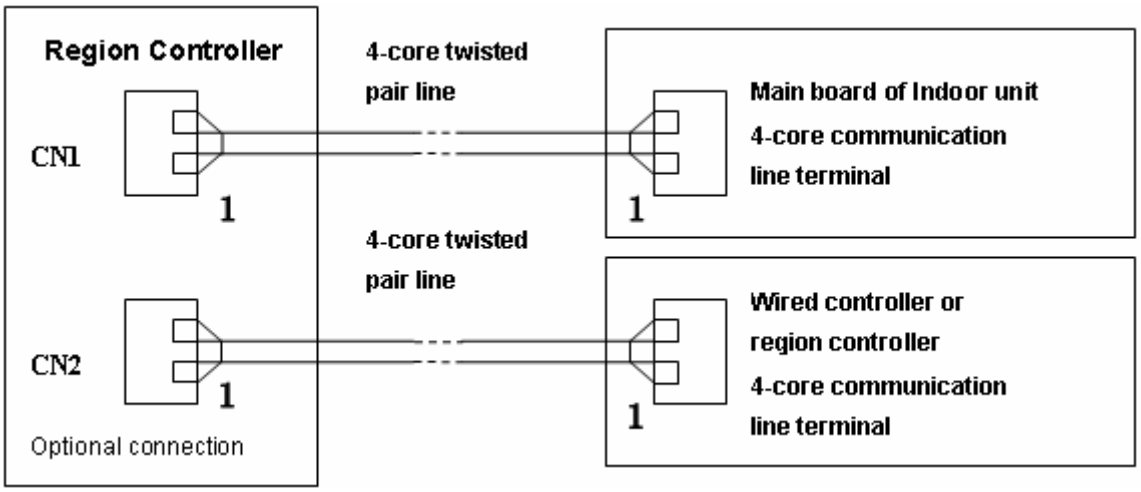


Fig2.1 Power cords and communication lines for mini centralized controller (region controller)

Before installation and connection, make sure the power supply is off. After installation and connection, check the connection result again to prevent loose or short.

There are 4 connection lines (included in the 4-core twisted pair line) to the controller, from CN1 or the upper and right CN2 to the upper they respectively are: Ground line (GND), communication line A (A), communication line B(B) and power cord (+12 v).

Note:

During following connection of wirings, pay special attention to them to avoid malfunction to units for electromagnetic interference.

1. Keep the signal lines or wirings (communication) of mini centralized controller (region controller) or wired controller at least 20 cm from the power cords or connecting lines between indoors and outdoors to prevent abnormal communication.

2. Shielding twisted pair line must be adopted as signal line or wiring (communication) once the unit is installed in the place where there is serious electromagnetic interference.

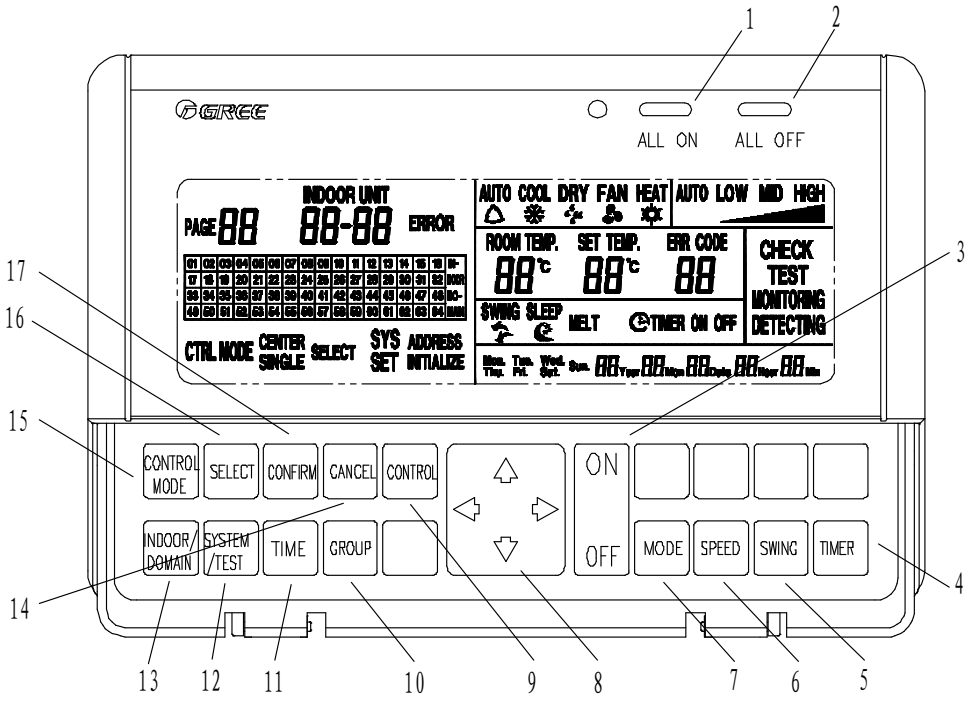
6 CENTRALIZED CONTROLLER

6.1 Function

Main characteristics of Centralized Controller:

- A set of Centralized Controller can control 64 communication modules and can connect to as much as 1024 indoor units. It can conduct individual control with any separated area or unified control. It can monitor or control On/Off, Mode, Temperature setting and Timer On/Off of indoor unit etc.
- It can realize the central, single or select control to all indoor units.
- It can organize several indoor units into groups as you desired and conduct unified control—Group select control.
- Error contents are shown by codes. Corresponding communication module numbers of the indoor units with error contents would blink for rapid inspection and repair (There is sound warning for a few errors).
- Timer function. Every indoor unit can set Timer On/Off time by central, single or select control. Both Timer On time and Timer Off time can be set at the same time, and it is available to set the timer to which day among the 7 days from Sunday to Saturday works.
- Clock function displays in year, month, day, hour, minute and week, and the clock can be manually adjusted.
- Indoor and outdoor units online auto detect, display and working state indication.
- Self-inspection function is remained.
- Centralized Controller and several communication modules formed communication net, the length of communication wire of the net can be as long as 1km (without using communication repeaters).

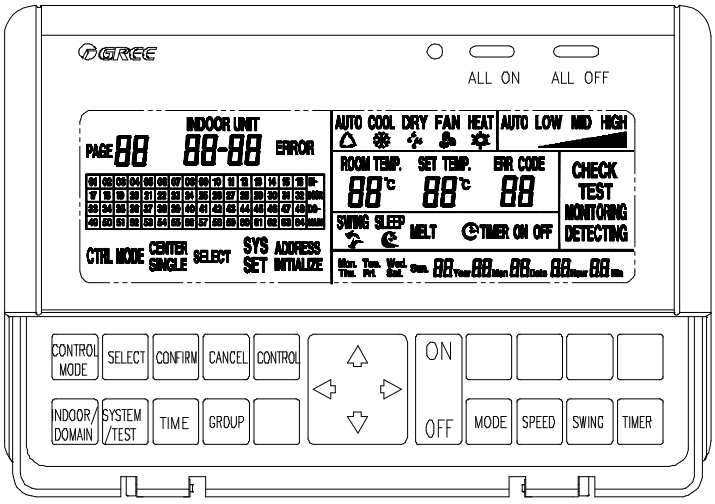
6.2 Operation View



(Fig.6.2)

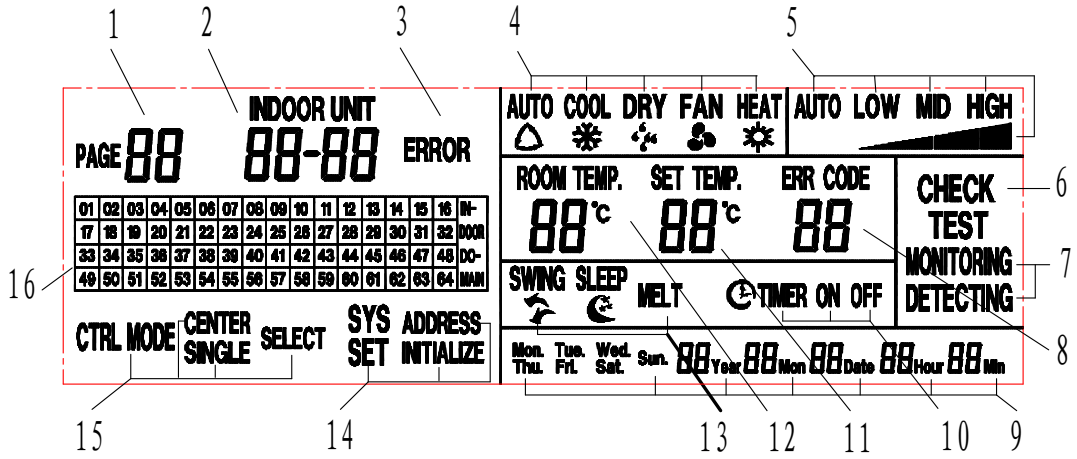
1	ALL ON	This central control has Sequence On function, that enable conduction to sequence control to communication modular in interval of 2 seconds, communication modular controls Sequence On of indoor units (to lower impact to power network).
2	ALL OFF	This central control has Sequence Off function, that enable conduction of sequence control to communication modular in interval of 2 seconds, communication module controls Sequence Off of indoor units (to lower impact to power network).
3	ON/OFF (2)	For controlling units' on and off.
4	TIMER	Set and check the time of Timer On and Timer Off of indoor unit and date mode.
5	SWING	Set if indoor unit swings
6	SPEED	Set fan speeds of High, Medium, Low or Auto for indoor unit
7	MODE	Set modes of Cool, Dry, Fan or Heat for indoor unit
8	LEFT/RIGHT UP/DOWN	It works as direction and adjusting under every operation function. Such as: When checking, it can move to the required indoor unit or communication modular by using this button; when adjusting time, press LEFT (/RIGHT) to shift "Y/M/D" etc. and press UP (/DOWN) to adjust value
9	CONTROL	Under control mode, press this button after setting state of indoor unit, control to indoor unit would be conducted by corresponding control mode.
10	GROUP	Press button under checking state to begin information check and set of grouped indoor unit, grouped information is for select control.
11	TIME	Set system time
12	SYSTEM/TEST	Begin setting of central control run mode, it is not recommended to be used by users.
13	INDOOR/DOMAIN	Shift display domain and indoor wired air condition control. **DOMAIN** corresponding to display on line communication modular, **INDOOR** corresponding to display on line indoor control.
14	CANCEL	Press this button during process of setting function to exit the already made function setting operation. Such as, if central control mode were selected, press CANCEL at this time would back to control mode selecting state.
15	CONTROL MODE	Begin control setting mode, and Central Control, Select Control and Single Control can be selected. Central Control: Control all indoor units under domain by present set state. Single Control: Control present indoor unit by present set state. Select Control: Control selected indoor unit by present set state, it also called grouped control
16	SELECT	Select required control or setting object; repress the button to the object is to cancel.
17	CONFIRM	Confirm the operated operation is effective

6.3 Display View



(Fig.6.3.1)

Sketch for LCD part:



(Fig.6.3.2)

1	Pagination/displays present domain	Under select control mode, **group no.** that is present controlling is displayed; Under addresses setting state, present **Soft Add** is displayed.
2	Present unit no.	Displays the soft address of communication module that the present checking or controlling indoor unit is belonged as well as the address of indoor unit; Format: Soft add—Indoor unit add
3	Error	Displays when there is error at any indoor or outdoor unit.
4	Operation mode	Displays every operation state mode of indoor unit
5	Speed display	Displays High, Medium, Low and Auto speed of indoor unit
6	Check	Under group control mode, it is displayed when checking grouping information; Under address setting mode, it is displayed when checking hard address.
7	Operation monitoring and controlling /monitoring	When central control works in normal, operation monitoring displays; when control signal is transmitted, operation monitoring and controlling is displayed.
8	Error code	Displays when abnormal occur on operation state of present indoor unit.
9	System time	Displays present time, format is Y, M, D, H, M and week.

10	Timer setting	**Timer On/Off** on when Timer On/Off is set to present indoor unit
11	Pre-set temperature	Displays value of pre-set temperature
12	Ambient temperature	Displays value of ambient temperature of present indoor unit
13	Swing and Defrost	Displays operation of swing at indoor unit and defrosting at outdoor unit
14	System setting	Setting operation mode of central control. It should be completed by installation personnel, but not for users.
15	Control mode	Displays 3 control modes of Central, Single and Select controls
16	Displays of soft address	When **Indoor** on, addresses of present online indoor unit is displayed; When **domain** on, soft address of present online communication module is displayed; Specific location of controlled indoor unit can only be ascertained when soft address fits **Project Installation List**.

Instruction to display interface:

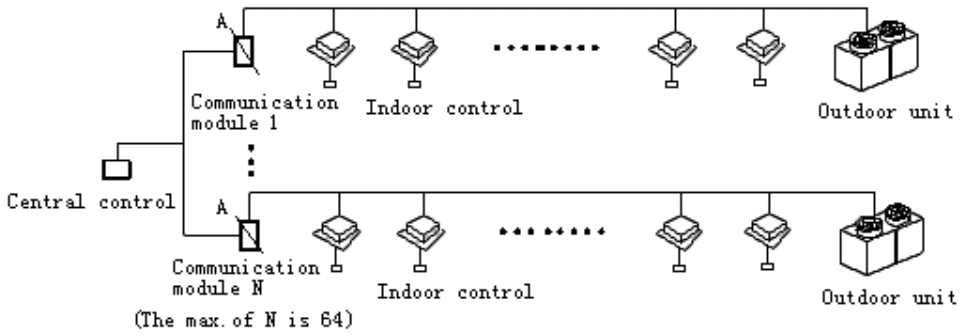
System Setting: Including Address Setting and other functions, and it is set when installation personnel are adjusting units. It is not recommended that users operate it. The usage of this function requires password.

Address Setting: Since characters from **01** to **64** are fixed as the **addresses of controlling communication modules displayed by central control** (hereinafter called **soft addresses**), and the **addresses of communication modules themselves** (hereinafter called **hard addresses**) are value from 0~254, thus there is address matching problem between central control and controlled communication module. In order to solve this problem, **address mapping setting is required to be conducted before project adjusting!**

6.4 Connection Between Controller and Unit

6.4.1 Communication network

The following is a brief sketch of communication net of multi variable units:

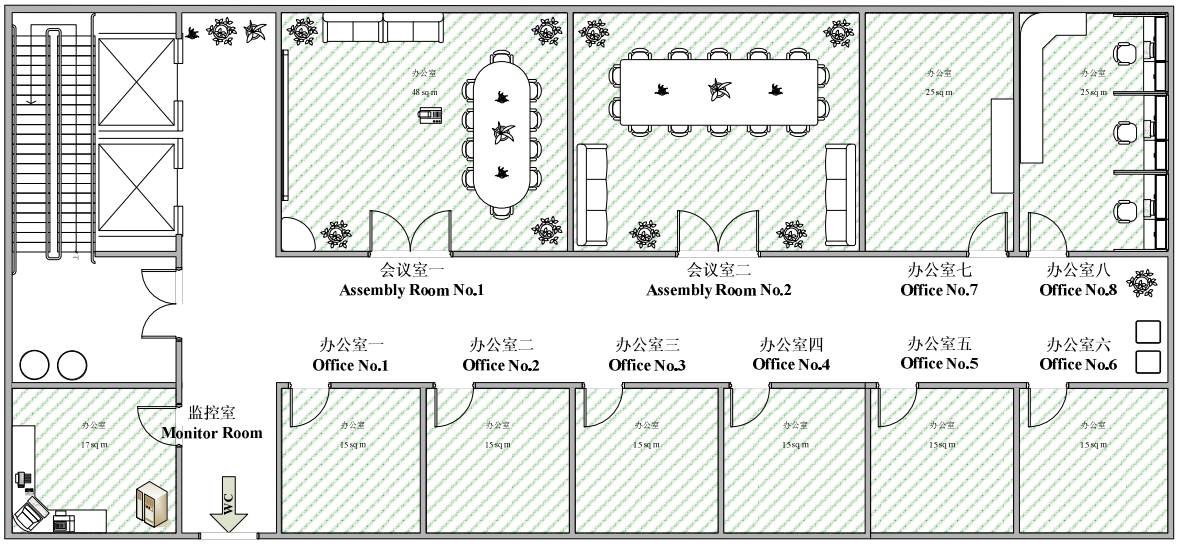


As shown in figure, the "\" at A are parting lines for communication net. Left side of the "\" is the communication net between central control and communication module while the right side is that between multi variable outdoor unit and indoor units. The 2 nets are individual nets.

Before normal use of central control, do conduct addresses setting and adjusting to communication system by installation personnel. Only after that can the central control offered to be used by user.

6.5 Case Study

Take one floor of an office building for example to illustrate wiring and debugging of the centralized control system. In this floor, there are 2 assembly rooms, 8 offices and 1 monitor room. Refer to the following illustration for its plane structure.



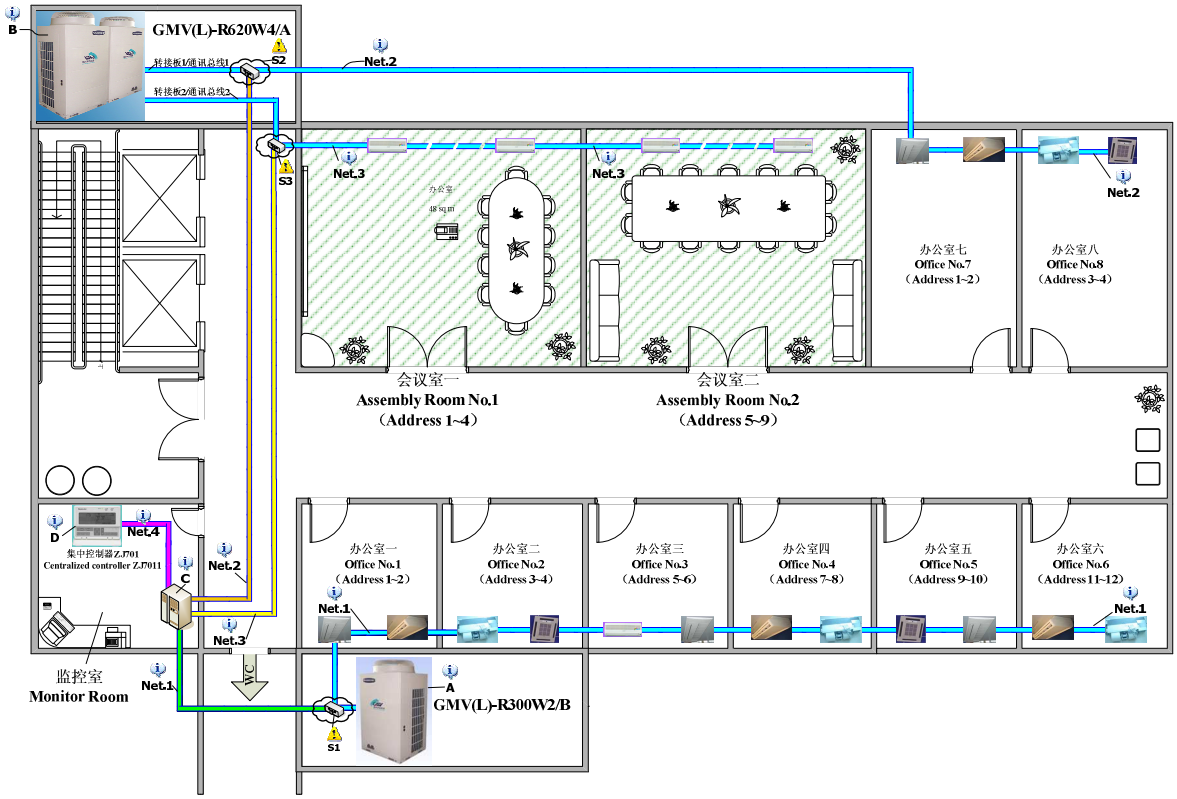
1）Instruction to Distribution of Unit and Installation of Equipment

This office building has been installed with 2 sets of GMV units, as shown in the table below.

Name	Models	Quantity of required communication modules (pinboard)	Quantity of indoor units	Corresponding rooms of indoor units		
				Room	**Address of communication module**	**Address of indoor unit**
Unit1	GMV-R300W2/D	1（0）	12	Office 1	01	1，2
				Office 2		3，4
				Office 3		5，6
				Office 4		7，8
				Office 5		9，10
				Office 6		11，12
Unit 2	GMV-R620W4/D	2（2）	20	**Room**	**Address of communication module**	**Address of indoor unit**
				Office 7	02	1, 2
				Office 8		3, 4
				Assembly room 1	03	1，2，3，4

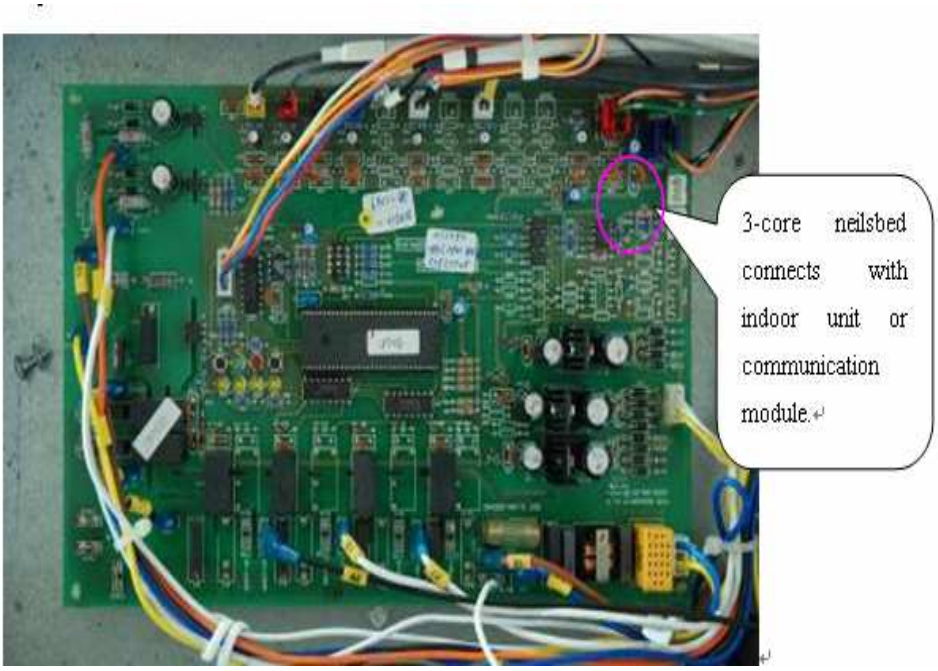
				Assembly room 2		5，6，7，8

2）Frame Diagram of System Net



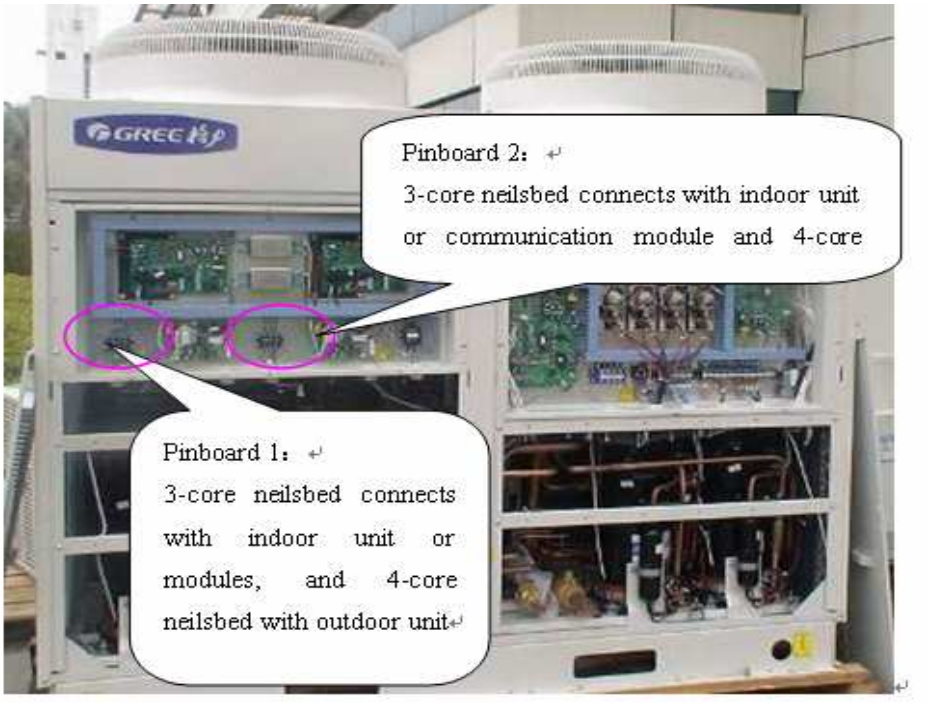
Instruction to Frame Diagram of System Net

Mark A: Outdoor Unit GMV(L)-R300W2/D can be connected with up to 16 indoor units. In this project, this outdoor unit is connected with the communication module with address of 01 and indoor units (address 01~12）of office 1-6, corresponding with independent communication **Net.2**. The mainboard of outdoor unit is as follow:



Mark B: Outdoor Unit GMV（L）-R620W4/A can be connected with up to 32 indoor units by two pinboards ,either of which can connect with up to 16 indoor units . What's more, the quantity of communication modules used is the same as that of pinboards.

In this project, pinboard 1 is connected with the communication module with address of 02 and indoor units (address 01~04）of office 7-8, corresponding with independent communication **Net.2.** Pinboard 2 is connected with communication module of address 03 and indoor units (address 01~08）of office 1-2, corresponding with independent communication **Net.3**. The outdoor figure is as follow:


Pinboard 2:
3-core neilsbed connects with indoor unit or communication module and 4-core
Pinboard 1:
3-core neilsbed connects with indoor unit or modules, and 4-core neilsbed with outdoor unit

Mark C: Centralized controller cabinet is mainly used to put communication modules together. Refer to Section 3 Instruction to Installation Procedure of System about its figure and connection method of communication modules.

Mark D: Centralized Controller ZJ701. For the first use of it, address mapping setting must be made to specify addresses of communication modules which should be controlled. In this project example there are 3 communication modules with the address of 01, 02 and 03 which are displayed in the centralized controller correspondingly.

Mark S1, S2, and S3: Telephone 3-way triple adapters are used to connect communication modules with communicating net of indoor and outdoor units. Refer to Section 3 Instruction to Installation Procedure of System for its connection method.

3） Instruction to Installation Procedure of System

- **Step 1: Integral Design of the Whole System.**

In consideration of features of building and installation of the unit, the building is divided into a lot of monitoring regions and then confirm required systems, their quantity and installation locations. As for this example:

A. Division of monitoring regions: According to needs of the users, the whole floor is divided into 3 monitoring regions, south area (office 1-6), north area (assembly room1-2 and office 7-8) and monitor room.

B. Confirmation of quantity of systems

Name	Qty	Installation Location	Notes
Communication modules	3	Centralized control cabinet	The quantity required for the pinboards is the same as communication modules. If no pinboard, only one module is needed. So, there should be 3 modules in total.
Centralized control cabinet	1	Monitor room	Installed indoors according to user’s conditions.
Centralized controller	1	Monitor room	Installed indoors

- **Step 2: Wiring and Installation**

A. Centralized controller as extension function of GMV unit can be installed and debugged after communication connection between outdoor unit and indoor unit and normal operation of the unit.

B. Make of centralized control cabinet

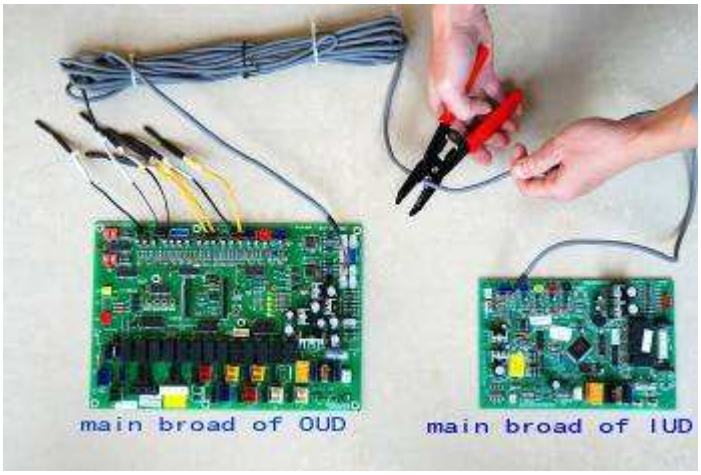
If a lot of communication modules are used, centralized control cabinet is recommended. Heavy current wires and communication lines should be wired separately. The distance between them should keep above 15cm.The following figure is an example of centralized control cabinet, but its design should be based on quantity of communication modules.

C. Connection of communication modules

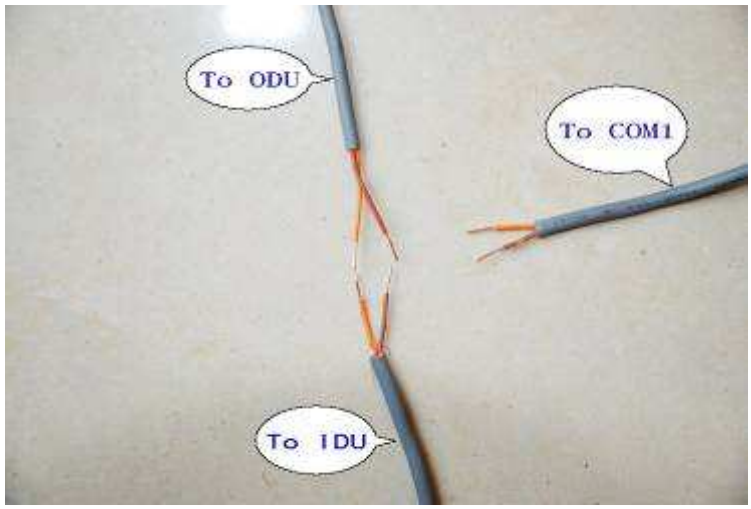
COM 1 of communication module can connect with indoor and outdoor unit. The two COM2 can connect with other communication module or centralized controller. As shown in the following figure:

D. Connection between communication module and indoor and outdoor units

According to the net diagram, connect the communication line between indoor unit and outdoor unit. Then cut off the communication line between the mainboards of indoor unit and outdoor unit, as shown below.



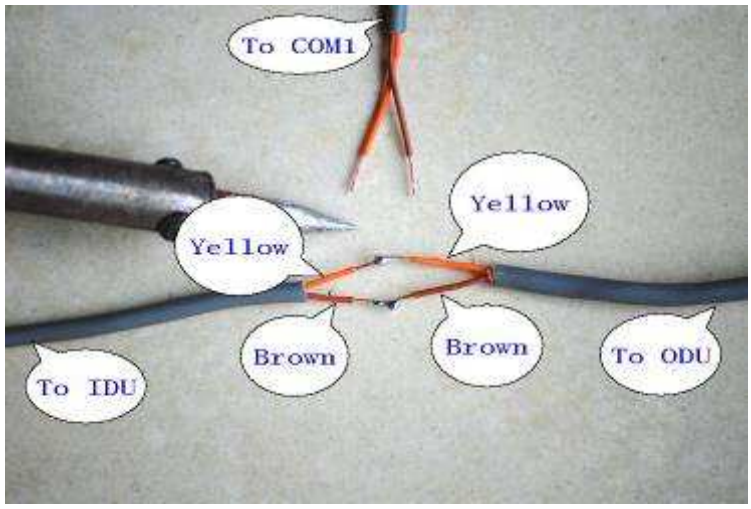
Align the cutting terminals and terminals of communication line to COM1, as shown below:



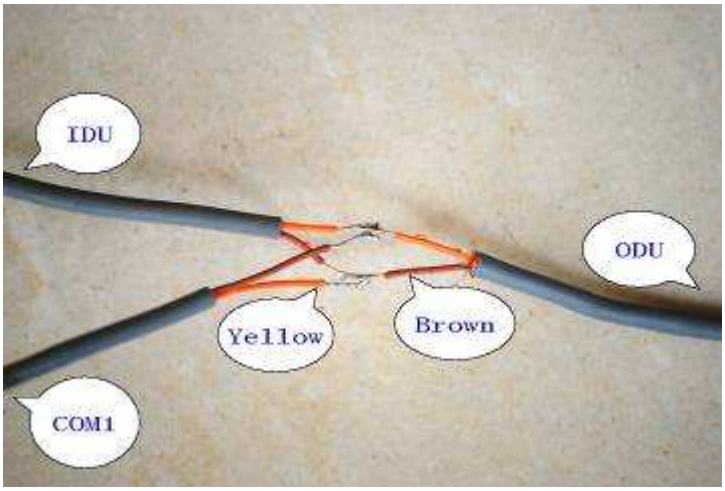
In this case, there are two methods of connecting them.

Method 1: Welding

Weld the two cutting terminals by yellow to yellow and brown to brown, as shown below:



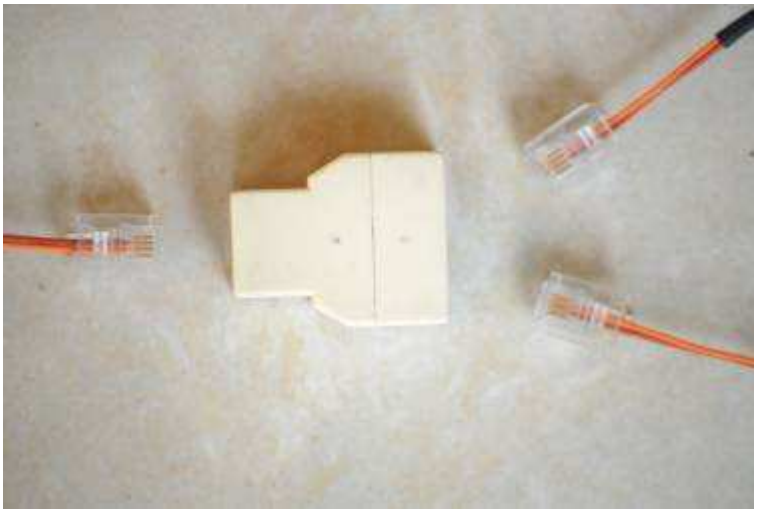
And then weld the terminals of communication line to COM1 with the welding spots in the above figure together by **yellow wire to brown wire**, as shown below:



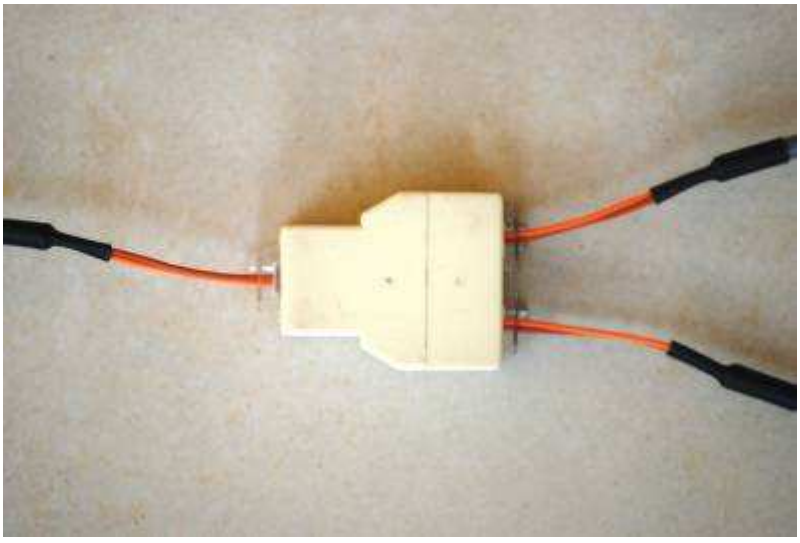
At last, wrap the welding spots with insulating tape and test conduction performance of the three communication lines, as shown below:

Method 2: Triple adapter

Make crystal heads for the three lines. The connection direction should be the same as in the above welding figures, i.e. yellow to yellow and brown to brown wire of indoor and outdoor units, but yellow to brown wire of communication line to COM1.The crystal heads are as follows:

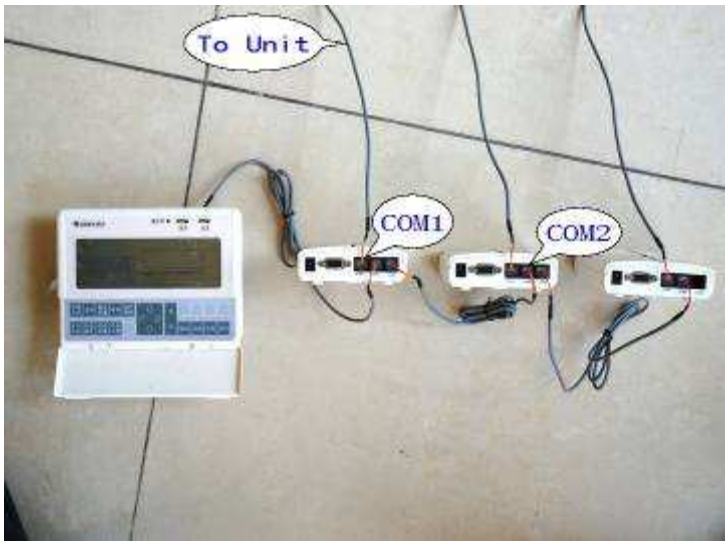


Insert the three crystal heads into the triple adopter and test conduction performance of them, as shown below:



E. Connection of Communication Modules and Centralized Controller

Connection of COM1 of communication module which has 3 COM in total has been introduced as the above. COM2 can connect with another communication module or centralized controller, as shown below:



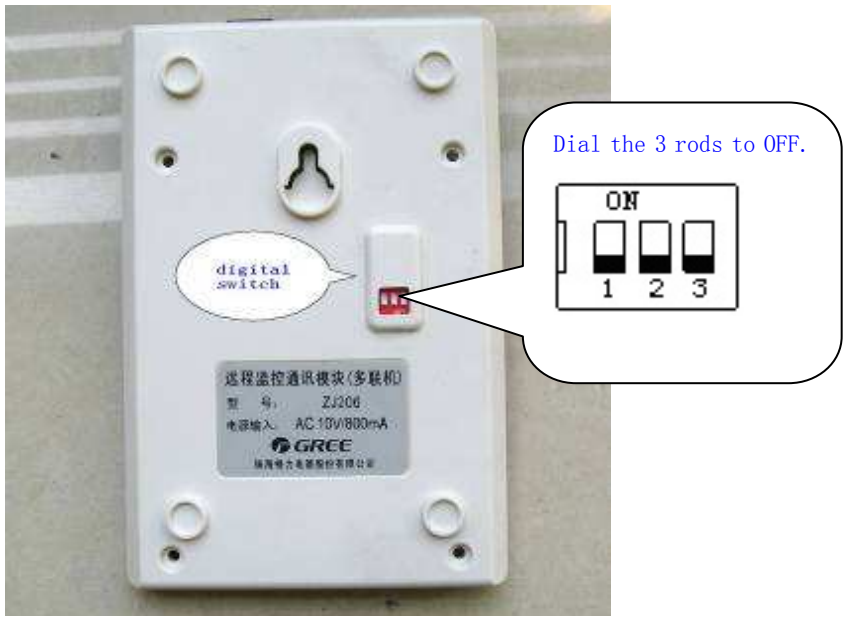
Note: The above figure is only for reference to relation among the equipments. The actual wiring is subject to the above frame diagram of system

• **Step 3: There are two methods of DIP address setting of communication module**

Method 1: The address of each communication module has been fixed in the factory and marked on the label at the back of it. It is unnecessary for users to set anything. In addition, the 3-digital DIP can not be dialed to OFF completely, as shown below:

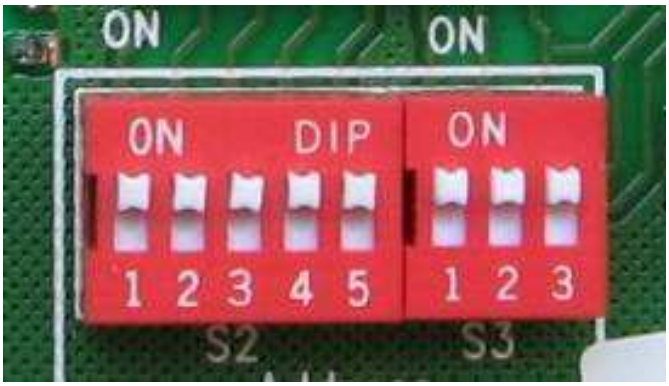
Method 2: Manual setting of address, as operated the following:

1. Dial the digital switch at the back of communication module to OFF completely, as below:



2.Open the cover of communication module as below:

The 8-digital DIP is as below:



Set DIP for address according to the following table.

Address from 0 to 31								Address	Address from 32 to 63								Address
DIP S2					DIP S3				DIP S2					DIP S3			
1	2	3	4	5	1	2	3		1	2	3	4	5	1	2	3	
0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	1	0	0	**32**
1	0	0	0	0	0	0	0	**1**	1	0	0	0	0	1	0	0	**33**
0	1	0	0	0	0	0	0	**2**	0	1	0	0	0	1	0	0	**34**
1	1	0	0	0	0	0	0	**3**	1	1	0	0	0	1	0	0	**35**
0	0	1	0	0	0	0	0	**4**	0	0	1	0	0	1	0	0	**36**
1	0	1	0	0	0	0	0	**5**	1	0	1	0	0	1	0	0	**37**
0	1	1	0	0	0	0	0	**6**	0	1	1	0	0	1	0	0	**38**
1	1	1	0	0	0	0	0	**7**	1	1	1	0	0	1	0	0	**39**
0	0	0	1	0	0	0	0	**8**	0	0	0	1	0	1	0	0	**40**
1	0	0	1	0	0	0	0	**9**	1	0	0	1	0	1	0	0	**41**
0	1	0	1	0	0	0	0	**10**	0	1	0	1	0	1	0	0	**42**
1	1	0	1	0	0	0	0	**11**	1	1	0	1	0	1	0	0	**43**
0	0	1	1	0	0	0	0	**12**	0	0	1	1	0	1	0	0	**44**
1	0	1	1	0	0	0	0	**13**	1	0	1	1	0	1	0	0	**45**
0	1	1	1	0	0	0	0	**14**	0	1	1	1	0	1	0	0	**46**
1	1	1	1	0	0	0	0	**15**	1	1	1	1	0	1	0	0	**47**
0	0	0	0	1	0	0	0	**16**	0	0	0	0	1	1	0	0	**48**
1	0	0	0	1	0	0	0	**17**	1	0	0	0	1	1	0	0	**49**
0	1	0	0	1	0	0	0	**18**	0	1	0	0	1	1	0	0	**50**
1	1	0	0	1	0	0	0	**19**	1	1	0	0	1	1	0	0	**51**
0	0	1	0	1	0	0	0	**20**	0	0	1	0	1	1	0	0	**52**
1	0	1	0	1	0	0	0	**21**	1	0	1	0	1	1	0	0	**53**
0	1	1	0	1	0	0	0	**22**	0	1	1	0	1	1	0	0	**54**
1	1	1	0	1	0	0	0	**23**	1	1	1	0	1	1	0	0	**55**
0	0	0	1	1	0	0	0	**24**	0	0	0	1	1	1	0	0	**56**
1	0	0	1	1	0	0	0	**25**	1	0	0	1	1	1	0	0	**57**
0	1	0	1	1	0	0	0	**26**	0	1	0	1	1	1	0	0	**58**
1	1	0	1	1	0	0	0	**27**	1	1	0	1	1	1	0	0	**59**
0	0	1	1	1	0	0	0	**28**	0	0	1	1	1	1	0	0	**60**
1	0	1	1	1	0	0	0	**29**	1	0	1	1	1	1	0	0	**61**
0	1	1	1	1	0	0	0	**30**	0	1	1	1	1	1	0	0	**62**
1	1	1	1	1	0	0	0	**31**	1	1	1	1	1	1	0	0	**63**

Address from 64 to 95								Address	Address from 96 to 127								Address
DIP S2					DIP S3				DIP S2					DIP S3			
1	2	3	4	5	1	2	3		1	2	3	4	5	1	2	3	
0	0	0	0	0	0	1	0	**64**	0	0	0	0	0	1	1	0	**96**
1	0	0	0	0	0	1	0	**65**	1	0	0	0	0	1	1	0	**97**
0	1	0	0	0	0	1	0	**66**	0	1	0	0	0	1	1	0	**98**
1	1	0	0	0	0	1	0	**67**	1	1	0	0	0	1	1	0	**99**
0	0	1	0	0	0	1	0	**68**	0	0	1	0	0	1	1	0	**100**
1	0	1	0	0	0	1	0	**69**	1	0	1	0	0	1	1	0	**101**
0	1	1	0	0	0	1	0	**70**	0	1	1	0	0	1	1	0	**102**
1	1	1	0	0	0	1	0	**71**	1	1	1	0	0	1	1	0	**103**
0	0	0	1	0	0	1	0	**72**	0	0	0	1	0	1	1	0	**104**
1	0	0	1	0	0	1	0	**73**	1	0	0	1	0	1	1	0	**105**
0	1	0	1	0	0	1	0	**74**	0	1	0	1	0	1	1	0	**106**
1	1	0	1	0	0	1	0	**75**	1	1	0	1	0	1	1	0	**107**
0	0	1	1	0	0	1	0	**76**	0	0	1	1	0	1	1	0	**108**
1	0	1	1	0	0	1	0	**77**	1	0	1	1	0	1	1	0	**109**
0	1	1	1	0	0	1	0	**78**	0	1	1	1	0	1	1	0	**110**
1	1	1	1	0	0	1	0	**79**	1	1	1	1	0	1	1	0	**111**
0	0	0	0	1	0	1	0	**80**	0	0	0	0	1	1	1	0	**112**
1	0	0	0	1	0	1	0	**81**	1	0	0	0	1	1	1	0	**113**
0	1	0	0	1	0	1	0	**82**	0	1	0	0	1	1	1	0	**114**
1	1	0	0	1	0	1	0	**83**	1	1	0	0	1	1	1	0	**115**
0	0	1	0	1	0	1	0	**84**	0	0	1	0	1	1	1	0	**116**
1	0	1	0	1	0	1	0	**85**	1	0	1	0	1	1	1	0	**117**
0	1	1	0	1	0	1	0	**86**	0	1	1	0	1	1	1	0	**118**
1	1	1	0	1	0	1	0	**87**	1	1	1	0	1	1	1	0	**119**
0	0	0	1	1	0	1	0	**88**	0	0	0	1	1	1	1	0	**120**
1	0	0	1	1	0	1	0	**89**	1	0	0	1	1	1	1	0	**121**
0	1	0	1	1	0	1	0	**90**	0	1	0	1	1	1	1	0	**122**
1	1	0	1	1	0	1	0	**91**	1	1	0	1	1	1	1	0	**123**
0	0	1	1	1	0	1	0	**92**	0	0	1	1	1	1	1	0	**124**
1	0	1	1	1	0	1	0	**93**	1	0	1	1	1	1	1	0	**125**
0	1	1	1	1	0	1	0	**94**	0	1	1	1	1	1	1	0	**126**
1	1	1	1	1	0	1	0	**95**	1	1	1	1	1	1	1	0	**127**

- **Step 4: System Setting of Centralized Controller**

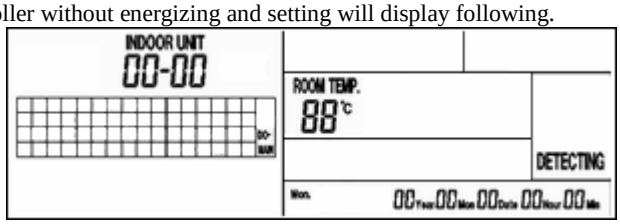
SYSTEM SETTING includes **ADDRESS SETTING** and **INITIALIZE SETTING.** The former one is used for setting address of control object (communication module), and the latter one for initializing the data in the centralized controller （including clear all the finished address settings）.

Since the centralized controller can control at most 64 communication modules and the address of them is 0 to 253 (0 is generally unused), it is necessary to specify the address of communication module needed to be controlled. It is **ADDRESS SETTING**, which is not recommended to operate by users.

The debugging personnel can press **SYSTEM/DEBUG** into system setting interface. After pressing **UP**, **DOWN**, **LEFT** and **RIGHT** buttons, press **CONFIRM** button into the interface for selection between **ADDRESS SETTING** and **INITIALIZE SETTING**.

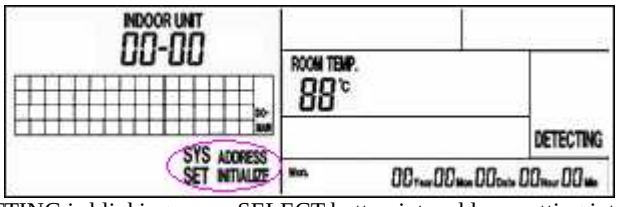
The operation procedure of **ADDRESS SETTING**:

1. The centralized controller without energizing and setting will display following.

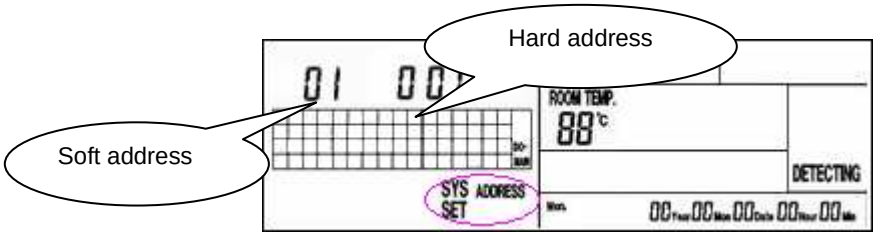


Display Present Unit No. 00-00 which means soft address 00-No. 00 indoor unit. (Soft address is the No. displayed in 1-64 grid of LCD.

Press **SYSTEM/DEBUG** into system setting interface. After pressing **UP**, **DOWN**, **LEFT** and **RIGHT** buttons, press **CONFIRM** button into the interface for selection between **ADDRESS SETTING** and **INITIALIZE SETTING**. Then press UP or DOWN button to switch between them.



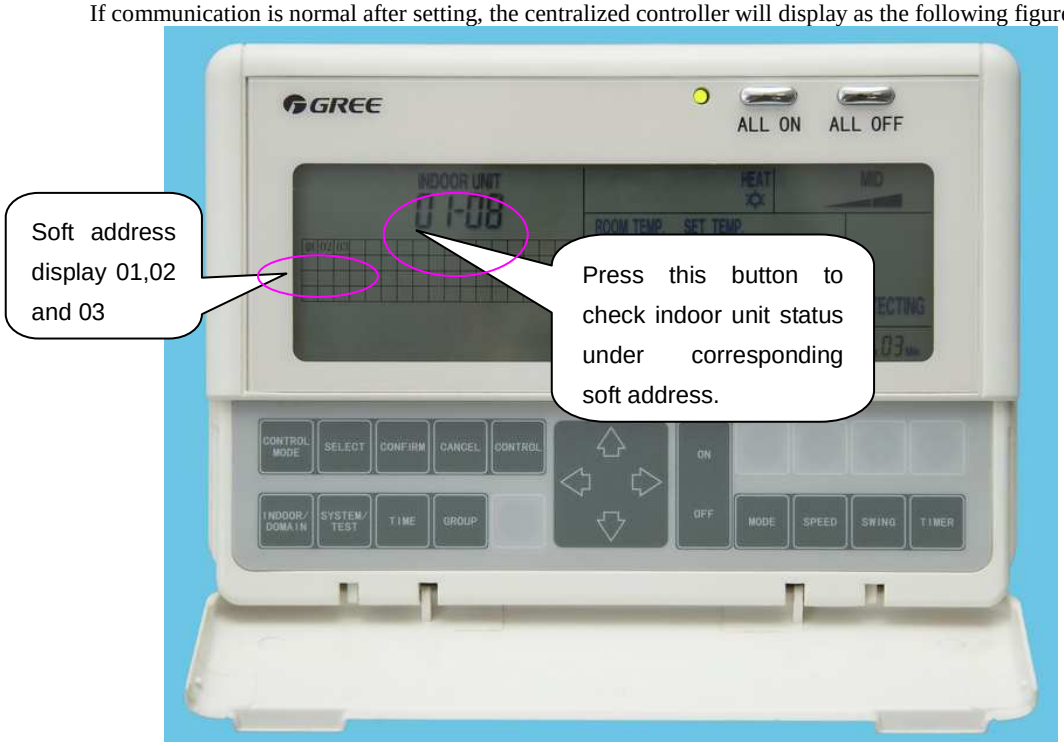
2. When ADDRESS SETTING is blinking, press SELECT button into address setting interface.



Press **LEFT** or **RIGHT** button to switch between SOFT and Hard ADDRESS settings, and **UP** or **Down** button to adjust their values。After adjustment, press **CONFIRM** button to make the address values corresponding and effective. If the cursor stops at hard address position (hard address is blinking), press **CANCEL** button to make the setting value ineffective, in which case, the "- -"will be displayed.(Soft address is the No. displayed in 1-64 grid of LCD and hard address is the actual one of communication module.)

In this example, the centralized controller controls 3 communication modules with the address of 01, 02 and 03 (i.e. hard address is 01,02 and 03).For convenient management, soft address will be set to the same as hard address, i.e. "01 001", "02 002"and "03 003".

If communication is normal after setting, the centralized controller will display as the following figure:



I. 01,02 and 03 of soft address is displayed, which indicates normal communication of these 3 communication modules.

II. PRESENT UNIT NO. displays "01-08", which indicates No. 08 indoor unit under 01 communication module is being checked.

III. Press ROOM/REGION button to check other indoor units' status under present communication module. Indoor units' status is automatically detected, without setting in centralized controller.

- **Step 5: Troubleshooting during Installation of Centralized Controller**

Generally speaking, **connection of communication lines**, a**ddress DIP of communication module** and a**ddress mapping setting of centralized controller** are the common problems during installation of centralized controller. These

problems can be reflected from running indicator (green) of communication module. Meanwhile, it is recommended to debug the centralized controller after making communication of outdoor and indoor units smooth to simplify the problems.

A. Connection of communication lines

① If incorrect or non-connection of communication module, centralized controller and communication line of indoor and outdoor units, the green indicator will be black all the time.

② It indicates connection problem between communication module and centralized controller that green indicator blinks once every 2s.In this case, COM2 must be used to connect them.

③ It indicates connection problem of communication module and indoor and outdoor units that green indicator blinks twice every 2s. In this case, COM1 must be used to connect them. Refer to Step 2, C for details.

B. Address DIP of communication module

There are two methods for address setting. The one is that communication module has been set by software store, but the 3-digital DIP switch can not be dialed to OFF completely. The other one is to set it manually, but the 3-digital DIP switch should be dialed to OFF completely. Refer to step 3 for details.

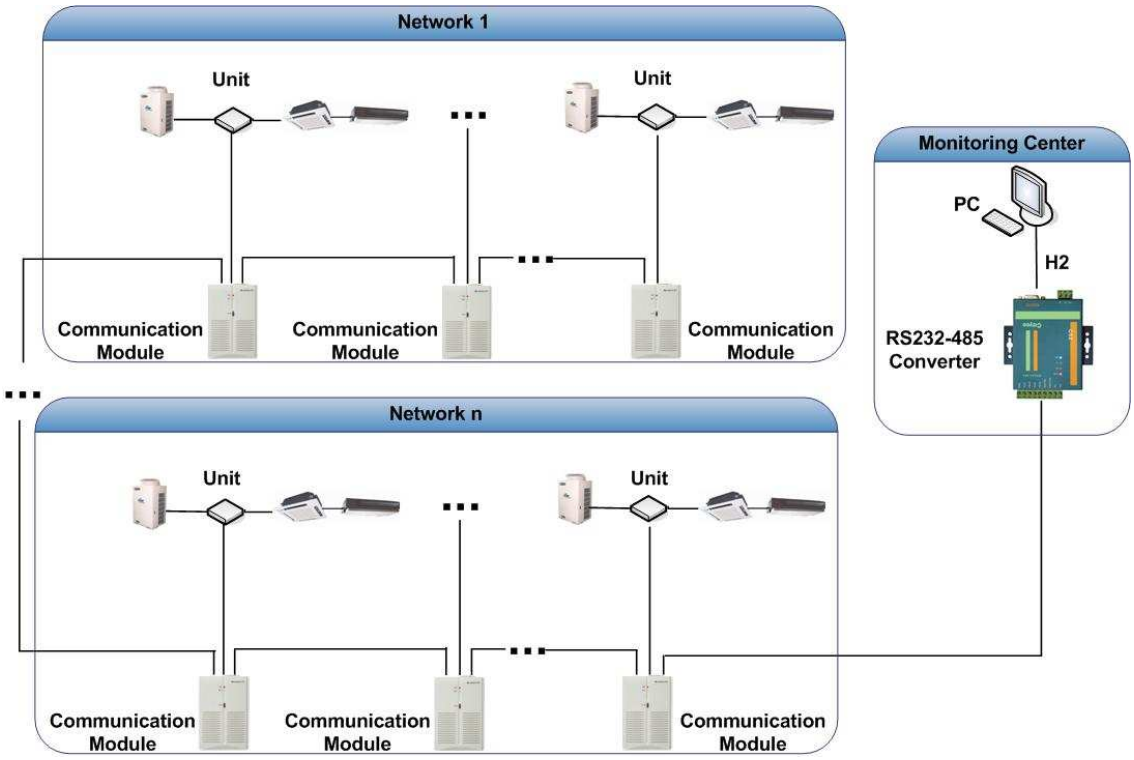
C. Address mapping setting of centralized controller

The centralized controller only can normally operate after specifying address of communication module needed to control. If not, the operation status of communication and indoor units can not be displayed by it. Refer to Step 4 for details.

7 MONITORING SOFTWARE

7.1 Function

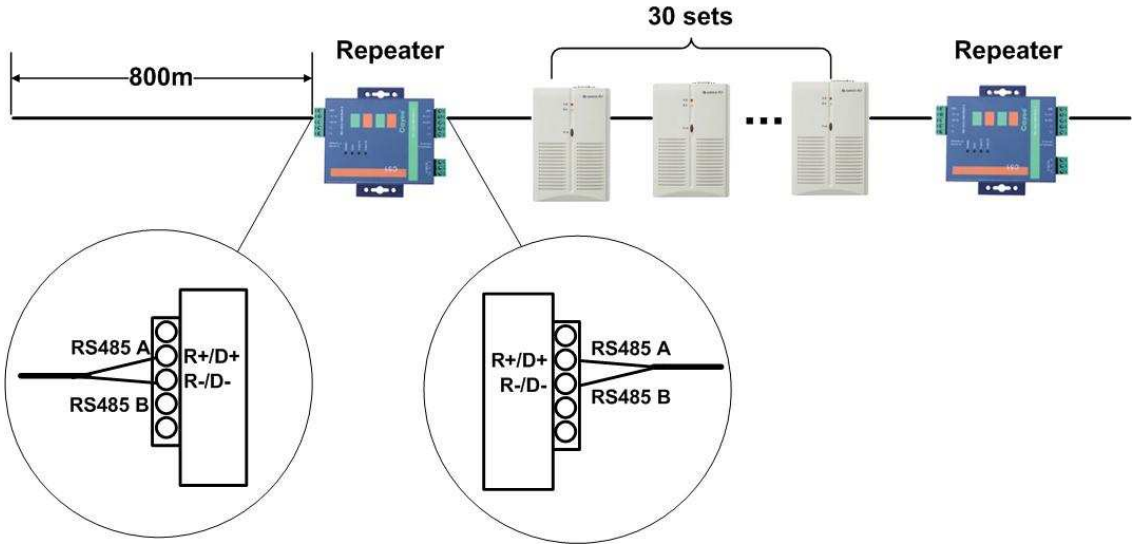
With the development and improvement of manufacturing technology and in order to solve the problems of complex distribution of the central AC in the buildings and difficult control and maintenance of them, an platform easy and reliable to operate must be provided to the users for daily management and maintenance. So this long-distance monitoring system combining electronic communication and computer technologies is developed to collect the running state of the units and to monitor and control the units from a long distance. Its structure is as follow:



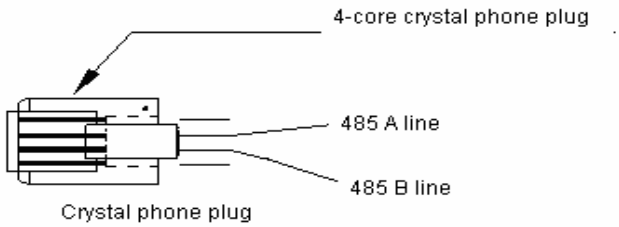
7.2 Connection Between the Computer and the Unit

Notice：

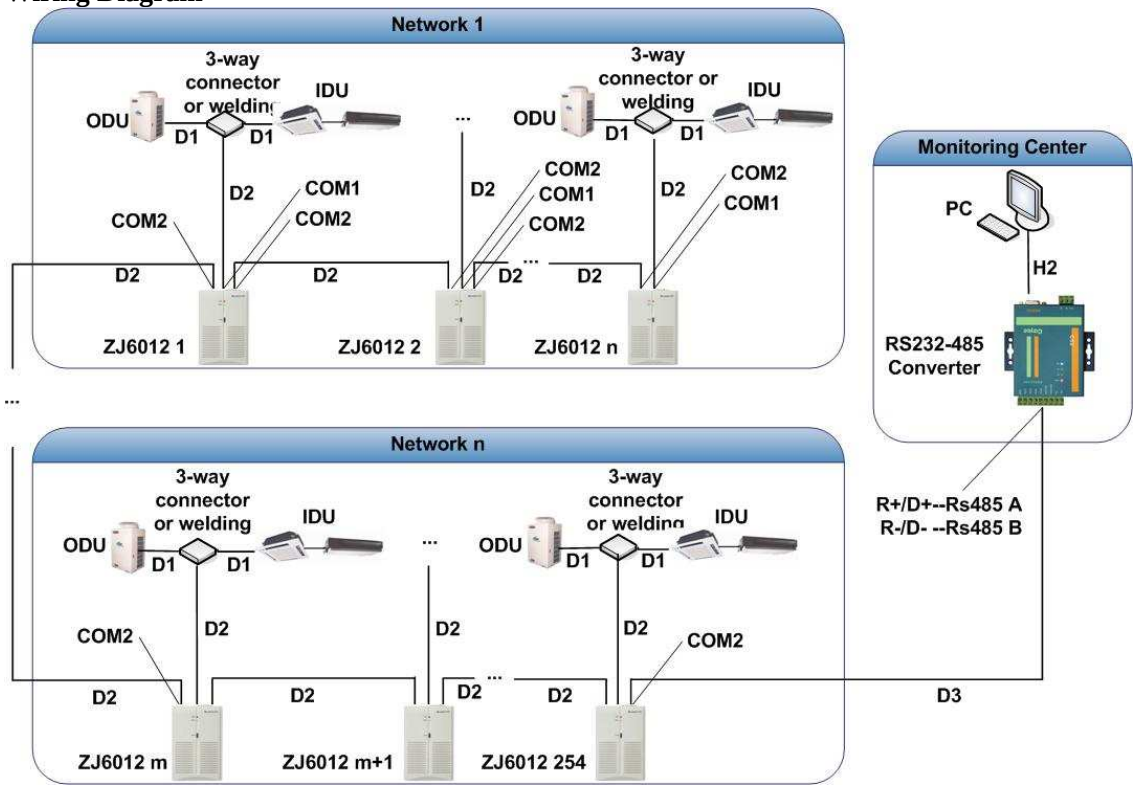
- The address code of the communication modules should not be conflicted in one project.
- Optoelectronic Isolated Repeater :One every 800m of communication distance equipped with one and One every 30 communication modules equipped with one.



- the communication cable and heavy-current wire should be separated and the distance between them can not be below 15cm
- line A and line B of Bus 485 should respectively correspond with line A and line B.
- crystal head（crystal head buckle is downwards）



Wiring Diagram



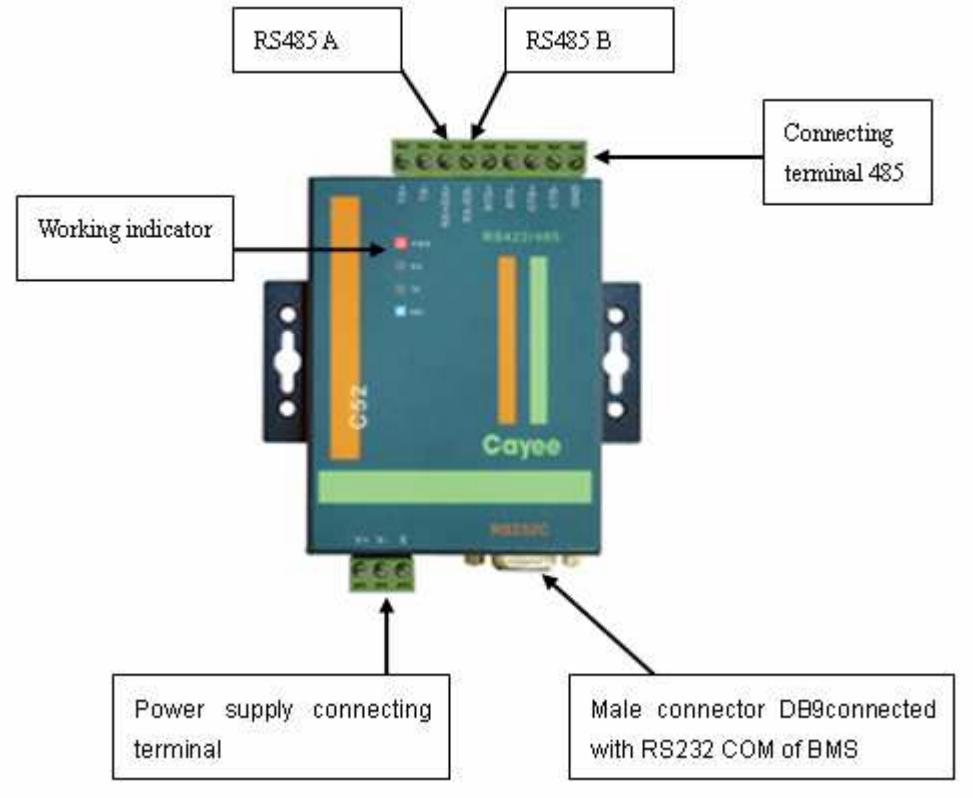
Description of above communication cables

Cable	Description
D1	crystal head and the other end is XH 4-core pin connector（2-core Type-V twisted pair wire）
D2	both crystal head(Standard parts)
D3	crystal head and the other end connects of it connects with wiring terminal of converter.（2-core Type-V twisted pair wire）
H2	both 9-core head (Standard parts)

7.3 Hardware

1. Introduction to Main Devices

1.1 R232-R485 Optoelectronic Isolated Converter (standard parts)



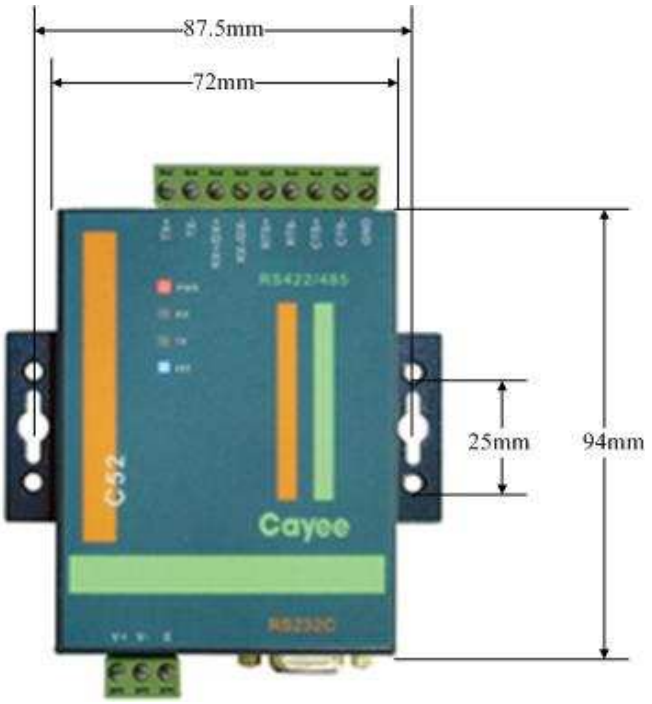
1）Function Introduction:

- R232-R485 optoelectronic Isolated converter is used to convert the signal 232 of PC COM and signal of bus 485.

2）Dimension

Description	L（mm）	W（mm）	H（mm）
optoelectronic isolated converter	94	72	23

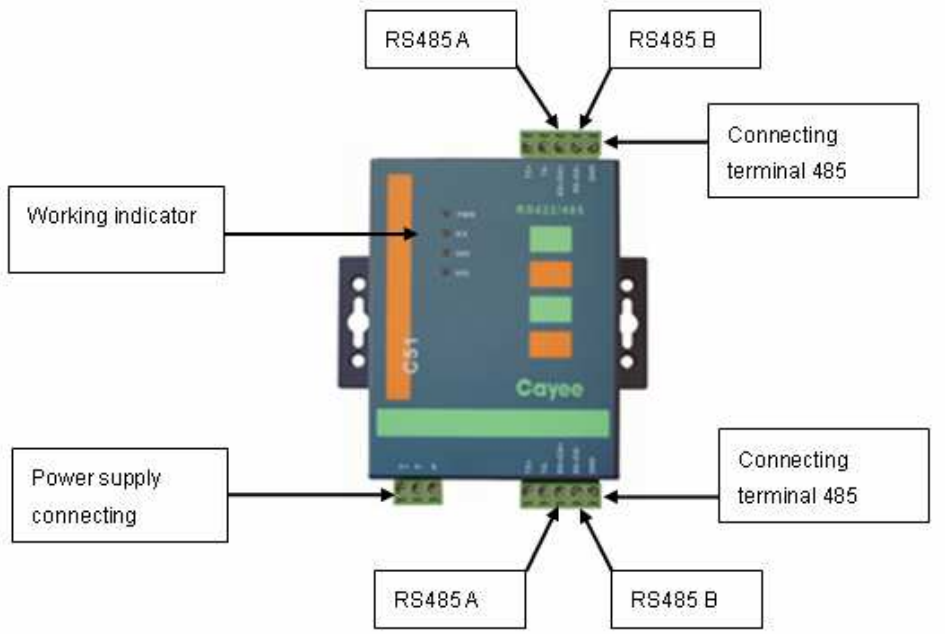
3）Installation Dimension



4）Installation Criteria:

- It must be installed indoors to avoid knock, insolation or rainwater and is better to be put in the monitoring room.
- This device must be the original one in the factory. Never self-buy the models for replacement.
- 220-V AC socket must be installed for independent power supply.
- Power supply specification: 12～30VDC 800mA

1.2 Optoelectronic Isolated Repeater(optional parts)



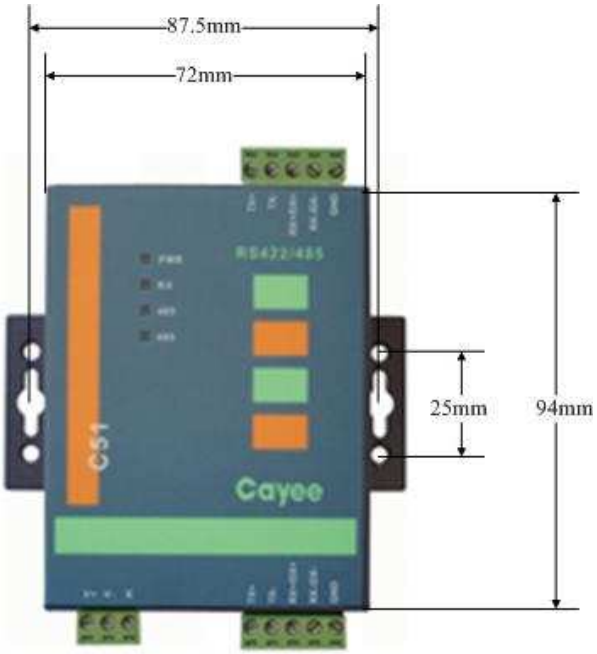
1）Function Introduction:

- Optoelectronic Isolated repeater is mainly used for collecting increase of communication distance and nodes when the quantity of communication modules is above 30 or communication distance is above 800m.Refer to Project and Installation section for details.
- 2）Dimension

Description	L（mm）	W（mm）	H（mm）

Optoelectronic Isolated Repeater	94	72	23

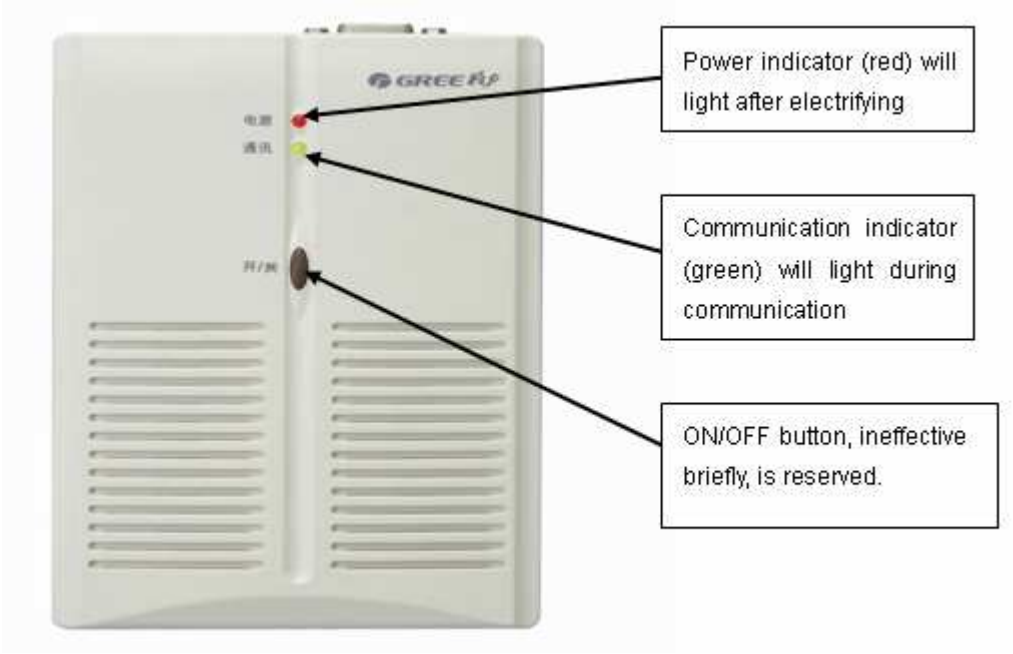
3）Installation Dimension



4）Installation Criteria:

- It must be installed indoors to avoid knock, insolation or rainwater and is better to be put in centralized control cabinet
- This device must be the original one in the factory. Never self-buy the models for replacement.
- 220-V AC socket must be installed for independent power supply.
- 12～30VDC 800mA Power supply specification: 12～30VDC 800mA

1.3 Communication Module (standard parts)

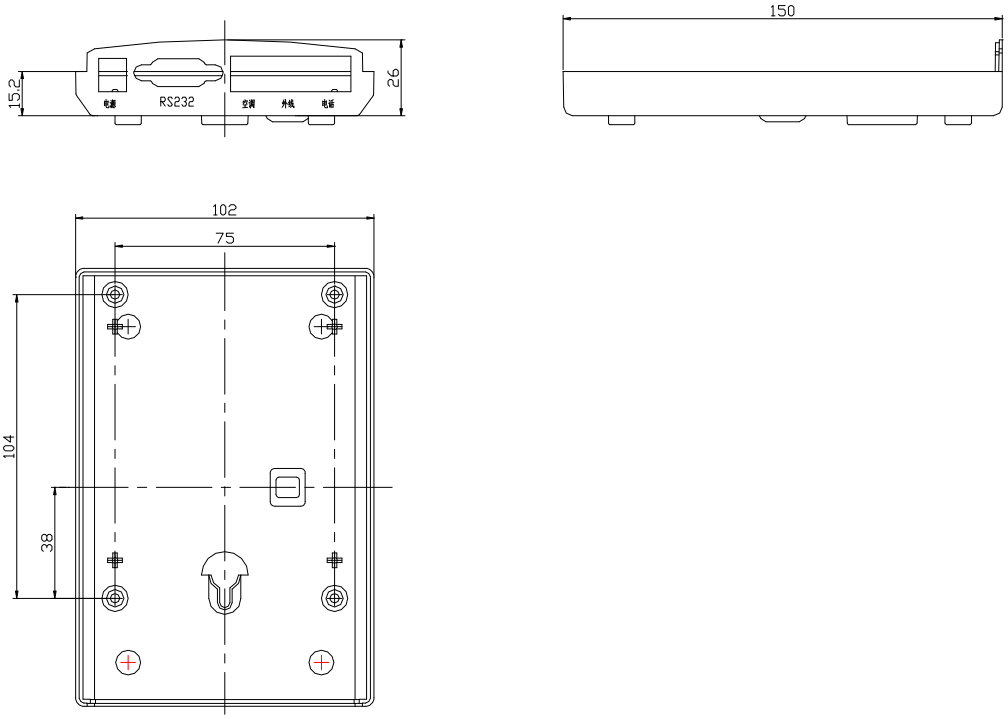

Power indicator (red) will light after electrifying
Communication indicator (green) will light during communication
ON/OFF button, ineffective briefly, is reserved.

1）Function Introduction

- Communication module is used for conversion and transfer of signal of PC and air conditioner during the communication of them, making the role of communication controller. Refer to User Instruction to Communication Module for details.

2）Dimension:

Description	L（mm）	W（mm）	H（mm）
Communication module	150	102	30

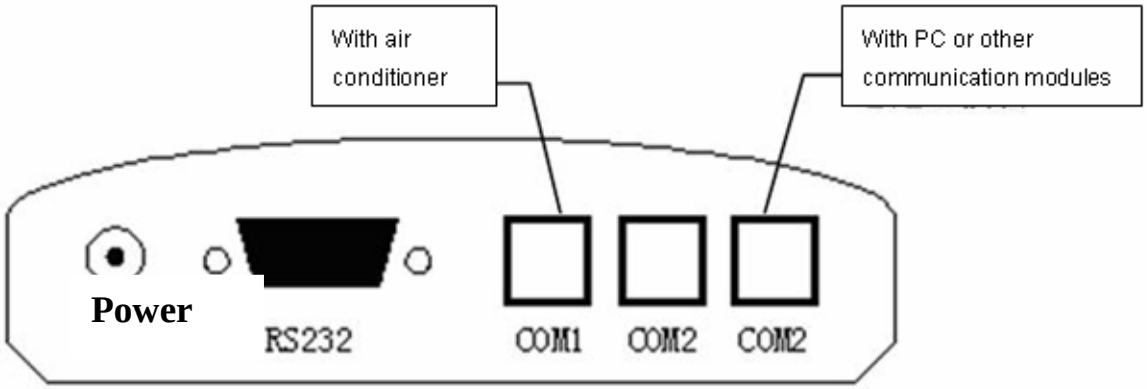


3）Installation Dimension:

Description	Distance to top side（mm）	Diameter（mm）
Hanging Hole	35	5

4）Use Instruction to Communication Module

- The Sketch Map of COM, as shown below:



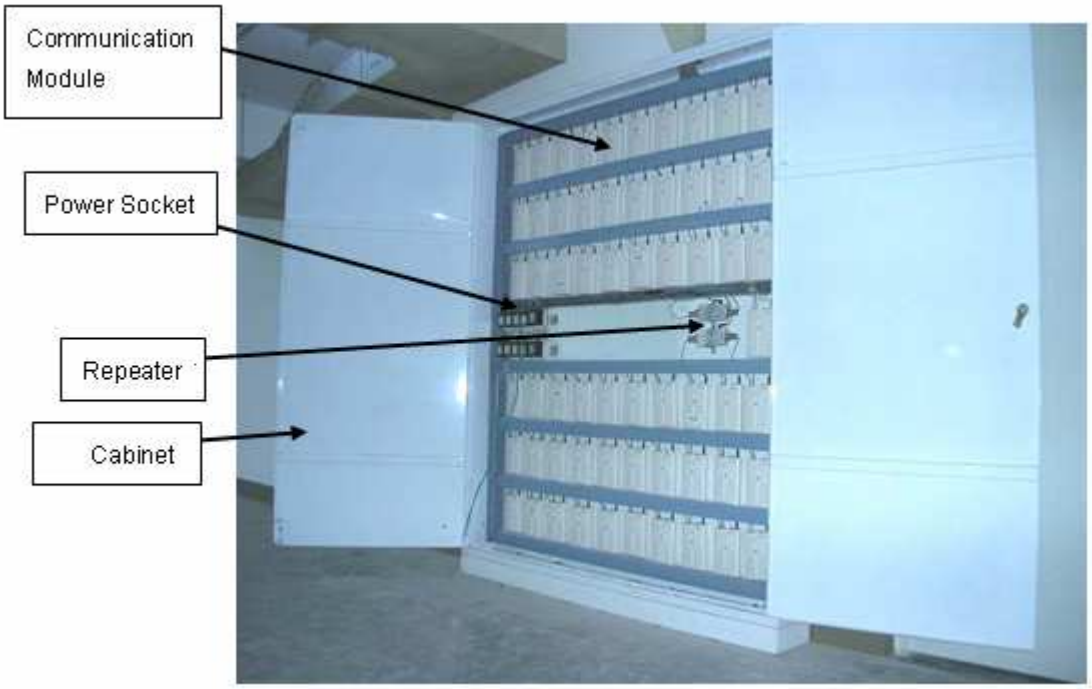
- Use Instruction

Please check the user manual of communication module for details information.

5）Installation Criteria of Communication Module:

- Ensure the specification of power adapter to avoid malfunction or damage to the communication module.
- Ensure unique DIP address of each communication module in the project to avoid malfunction.
- Ensure communication cable connects with correct COM to avoid malfunction.
- The communication modules should be put in centralized control cabinet together to avoid direct sunlight or high temperature and wet environment.
- Power transformer specification: input AC200V～50HZ and output DC9V～800mA

1.4 Centralized Control Cabinet (user provided parts)



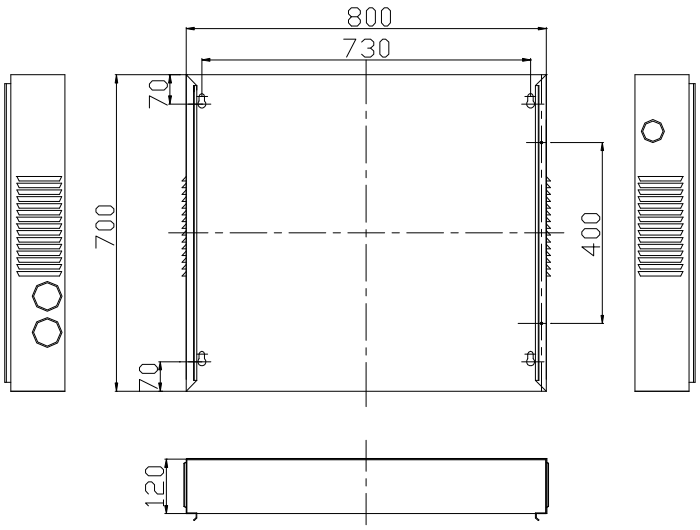
1）Function Instruction:

- The communication modules can be put together for convenient centralized management and reliable operation.

2）Dimension:

- The following dimension is for reference. The cabinet is designed according to 10 communication modules into. If more modules are needed, the cabinet should be designed once again. The internal structure should accord to actual state.

The external dimension of the cabinet (Unit: mm)

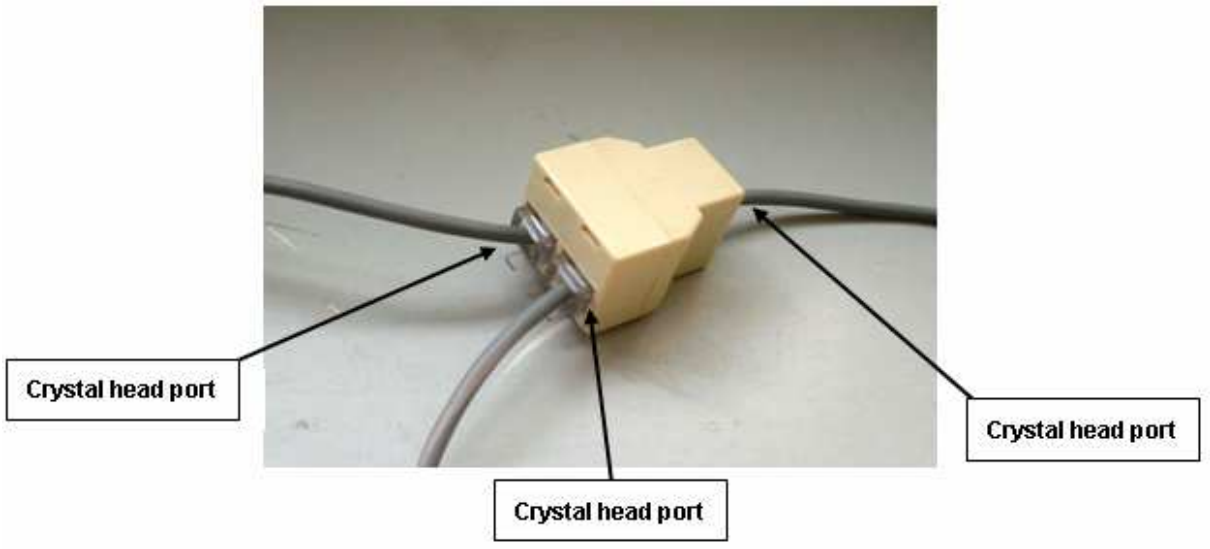


3）Installation Criteria:

- The dimension of the cabinet should be designed according to quantity , arrangement and location of the communication modules before make of it.
- Independent power supply for each communication module is needed, so enough 220v AC sockets should be installed in the cabinet.
- The communication cable and heavy-current wire should be separated for the distance above 15cm.
- The cabinet should be put indoors and locked to avoid insolation and rainwater or contact of non-manager.

1.5 3-way Phone Connector(user provided parts)

Note: Lines without 3-way telephone connector can be connected by welding and protected with insulating tape to avoid oxidization and short circuit.



1）Function Instruction: Common 3-way phone connector is applied to connect 3 pieces of communication cable.

Dimension ：

Description	L（mm）	W（mm）	H（mm）
3-way connector	33	27	21

2）Installation Criteria:

- Avoid knock, insolation or rainwater.
- Ensure tightness of each bayonet without load.
- Perform conduction test after installation. Replace the ones of poor contact.
- The welding method is better than 3-way connector.
- After the connection of communication cables with 3-way connector, it must be fixed by insulating tape to avoid loose and poor contact of crystal head.

INSTALLATION

INSTALLATION

1 PRECAUTIONS FOR INSTALLATION

1.1 Precautions for Installation

Before installation, please ensure if the installing site, power ratings, possible operating range (pipe distance, height difference between indoor and outdoor unit, power voltage) and installing space are correct and suitable. The outdoor unit is general to all models according to its power.

- To ensure correct installation, please make sure to read the Safety Considerations thoroughly before starting the installation works.
- The considerations stated below are classified into ⚠WARNING and ⚠CAUTION. Those that might cause death or severe injury in case of wrong installation are identified in ⚠WARNING. However, those that are stated in ⚠CAUTION may also cause severe accidents sometimes. Therefore, both of them relate to important safety considerations and must be strictly followed.
- After completing the installation and test run and confirming that all are normal, please introduce to the client on how to use and repair the machine according to the Operating Instructions. Besides, please deliver the considerations herein to the clients together with the Operating Instructions, and ask them to keep properly.

⚠ WARNING!

- The installation shall be performed by the vendor or professional dealer from which you buy the machine. If you install by yourself, any improper installation might cause water leakage, electric shock or fire accident.
- The installation shall be done correctly according to installation instructions. Improper installation may cause water leakage, electric shock or fire.
- To install a large air-conditioning system in a small room, please make sure to take measures to prevent that the refrigerant will not exceed the limit concentration in case of leakage. For the measures to prevent the refrigerant from exceeding the limit concentration, please consult your dealer. If no proper measures, it might cause human suffocation in case of refrigerant leakage.
- Please install at a position that is strong enough to support the weight of machine. If the installing position is of low strength, the machine may drop down and thus cause human injury.
- Please carry out installation in accordance with the rules for preventing the typhoon or earthquake. The machine may tip over if the installation does not comply with the requirements.
- The electrical cabling shall be carried out by qualified electricians in accordance with the Safety Code for Electrical Equipment, relevant local rules and the installation instructions. Make sure to use the special-purpose circuit. If the power circuit capacity is low or the construction is improper, it might cause electric shock or fire accidents.
- Please use suitable cables and connect them securely. Please fix the terminal joints securely. The terminal connection shall not be affected due to any external force applied onto the cable. Improper connection and fixing may cause heating and fire accidents.
- Keep the cables in correct shape and prevent them from protruding upward. Please protect them securely with repair board. Improper installation may cause heating and fire accidents.
- When erecting or relocating the air conditioner, do not let any air enter into cooling circulation system except the specified refrigerant. If any air is mixed, abnormal high pressure will occur in the cooling circulation system, thus causing crack or human injury accidents.
- During installation, please always use the attached parts or designated parts. Failure to use the designated parts may cause water leakage, electric shock, fire or refrigerant leakage.

⚠ CAUTION:

- Please earth securely. Do not connect the earth wires to gas pipe, water pipe, lightning rod or telephone line. Improper earthling might cause electric shock.
- Leakage circuit breaker must be installed at some place. No installation of leakage circuit breaker might cause electric shock.
- Do not install at a place where inflammable gas might leak. Gas leakage and despot around the machine might cause fire accidents.
- To ensure correct drainage of water, the drainage pipe shall be installed according to the installation instructions. Also the heat insulation shall be provided to avoid condensing. Improper installation of the pipe might result in water leakage and lead to possible wetting of the articles in the room.

1.2 Key Points of Installation

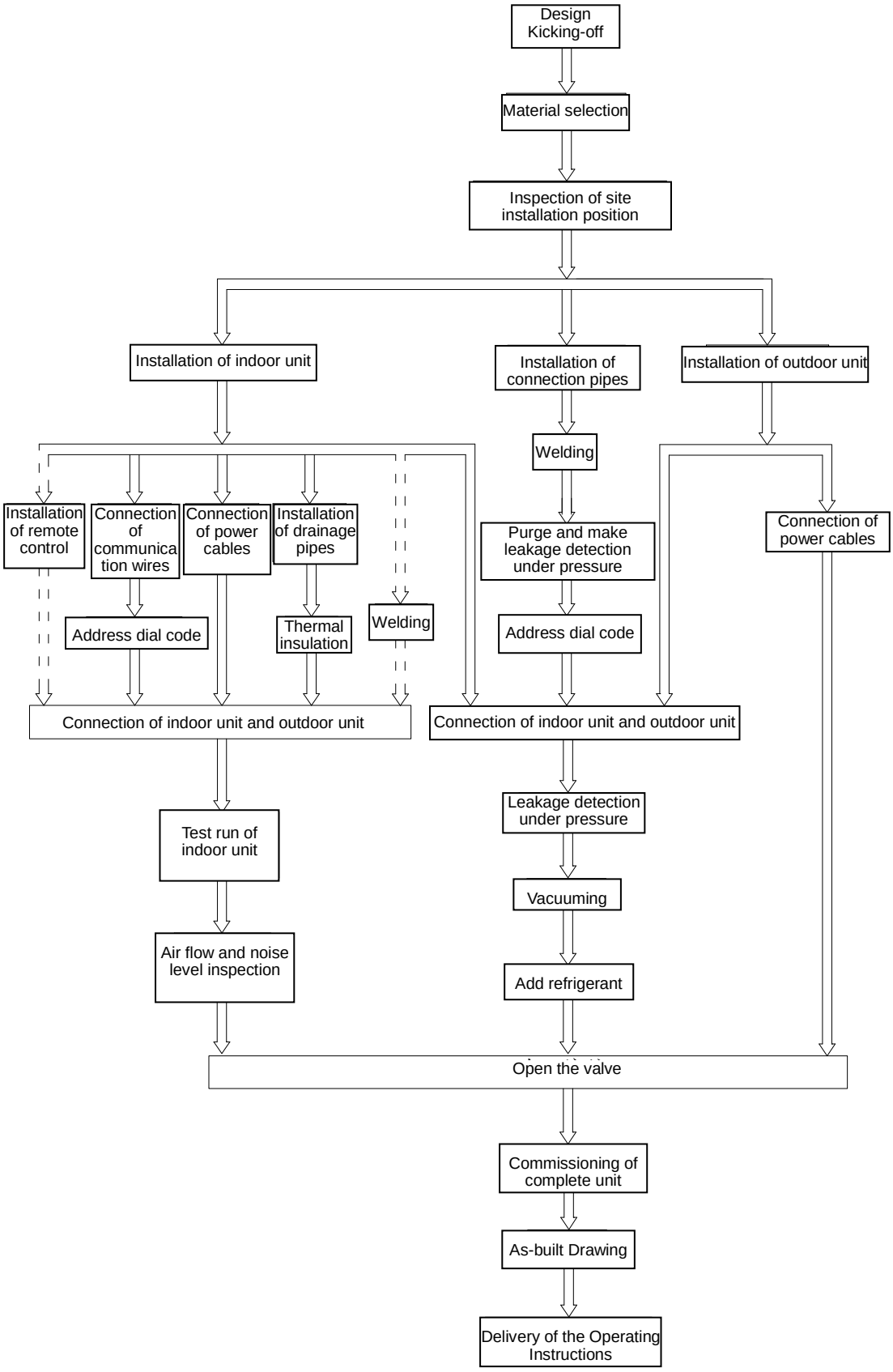
<table>
<tr><th colspan="3">Installation Procedures</th><th>Description and Acceptance Criteria</th></tr>
<tr><td colspan="3">Material Selection and Equipment Inspection</td><td>1. The materials specified on the engineering drawing shall be purchased as specified (e.g. copper tube, thermal insulation tube, PVC pipe, power cables, air switch, etc);
2. The materials not specified on the engineering drawing shall be purchased according to the actual quantity of works (e.g. hanger frame, cable duct, etc);
3. Check if the outdoor unit, indoor unit, communication wires and accessories are complete.</td></tr>
<tr><td rowspan="6">Installation of indoor unit</td><td rowspan="2">Communication wire</td><td>Connection</td><td>1. The power cables shall be separated from communication wires at a least distance of 10cm.
2. To avoid breaking the communication wires, please do not use strong force.
3. For multiple units, please mark them properly.
Switch on indoor and outdoor unit, and ensure there is no display of “Communication Wire Error E6”</td></tr>
<tr><td>Address dial code</td><td>1. Each indoor unit under the same system has a unique address dial code.
2. The wired controller and its corresponding indoor unit have the same address dial code.</td></tr>
<tr><td colspan="2">Remote Control</td><td>1. Select the remote control mode;
2. The centralized controller and communication module shall be installed free from the source of interference.</td></tr>
<tr><td colspan="2">Power cord</td><td>1. The power cable must meet the specifications.
2. The indoor units under the same system must be arranged under unified power supply.</td></tr>
<tr><td rowspan="2">Drainage Pipe</td><td>Installation</td><td>1. The PVC pipes must meet the specifications.
2. A specific gradient must be provided along the water flow direction.
3. Carry out water detection after installation.
Carry out thermal insulation to the drainage pipe only after the water detection is accepted.</td></tr>
<tr><td>Thermal insulation</td><td>1. The thermal insulation tube must meet the specifications.
2. Seal between the thermal insulation pipes to avoid air entry.</td></tr>
<tr><td colspan="2">Installation of Air Duct (when with high static pressure duct-type unit)</td><td>1. Design the length of air duct according to static pressure;
2. The air inlet shall be optimally designed to avoid too small size</td></tr>
</table>

Installation of connection pipes	Welding	1. The copper tube must meet the specifications. 2. Ensure it is dry and clean inside the tube. 3. Make sure to charge nitrogen as required for protection when welding the tubes. 4. Please keep to the welding process and ensure the system free of leakage. 5. Add a dual-way filter on liquid pipe side 6. For multiple systems, please mark them properly. Carry out leakage detection under pressure after welding.
	Purge and make leakage detection under pressure	1. Purge the system clean. 2. Keep the pressure for 24 hours Except for the influence by temperature, it is deemed acceptable if pressure drop is within 0.02MPa. (With the temperature change by 1℃, the pressure will change by approx. 0.01MPa)
	Thermal insulation	1. The thermal insulation tube must meet the specifications. 2. Seal between the thermal insulation pipes to avoid air entry.
Installation of outdoor unit		1. Select the installing position correctly. 2. Build the foundation according to the anchor bolt position and the dimension of outdoor unit 3. Build the damping device properly. 4. Avoid sharp knock when handling the outdoor unit. The inclination angle shall not be higher than 15°
Connection of indoor unit and outdoor unit		1. Tighten the nuts; 2. Provide proper protection to the outdoor connection pipe, communication wires and power supply.
Leakage detection under pressure		Keep the pressure for 24 hours. Except for the influence by temperature, it is deemed acceptable if pressure drop is within 0.02MPa. (With the temperature change by 1℃, the pressure will change by approx. 0.01MPa).
Vacuuming		1. Establish vacuum simultaneously in the gas pipe and liquid pipe; 2. The vacuuming time shall be long enough. Put still for 1 hour after vacuuming. It is deemed acceptable if the pressure will not rise.
Add refrigerant		Add refrigerant according to the volume as specified on the engineering drawing.
Open the valve of outdoor unit		
Commissioning of complete unit		

Remarks: 1) Described above are general working procedures. The procedures might vary with the site conditions.

2) For detailed installation rules, please see the description in each chapter.

2 FLOW CHART OF INSTALLATION


Design Kicking-off
Material selection
Inspection of site installation position
Installation of indoor unit
Installation of connection pipes
Installation of outdoor unit
Welding
Installation of remote control
Connection of communica tion wires
Connection of power cables
Installation of drainage pipes
Purge and make leakage detection under pressure
Connection of power cables
Address dial code
Thermal insulation
Welding
Address dial code
Connection of indoor unit and outdoor unit
Connection of indoor unit and outdoor unit
Leakage detection under pressure
Test run of indoor unit
Vacuuming
Air flow and noise level inspection
Add refrigerant
Open the valve
Commissioning of complete unit
As-built Drawing
Delivery of the Operating Instructions

3 INSTALLATION OF OUTDOOR UNIT

3.1 Hoisting of Unit

Transport the unit to a place as close as possible to the installing site before taking it out of the packaging box.

⚠ CAUTIONS!

Never put any object on top of the unit before and after installation.

To lift the machine with crane, please use two ropes to lift the outdoor unit.

◆ Hoisting Method

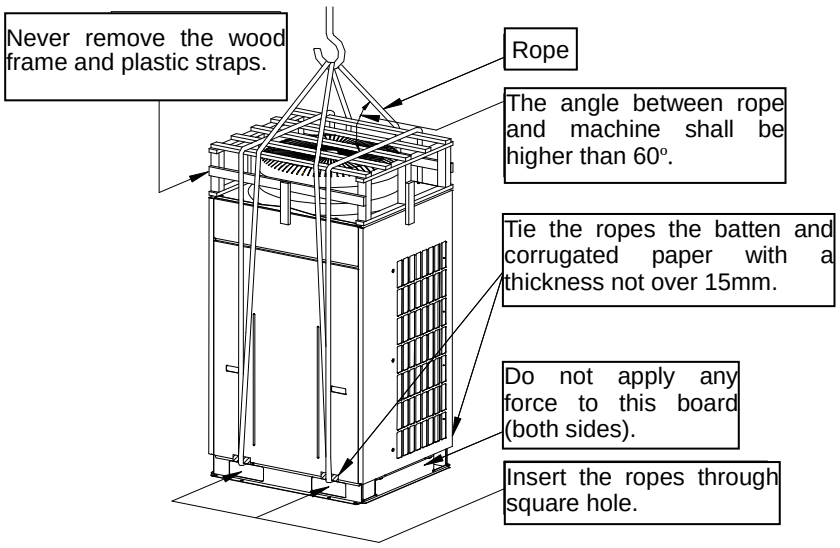
The machine must be balanced when it is lifted. Check and ensure that the machine can be lifted up safely and stably.

⚠ CAUTIONS!

Do not attach the ropes to the lower wood frame of the packaging box.

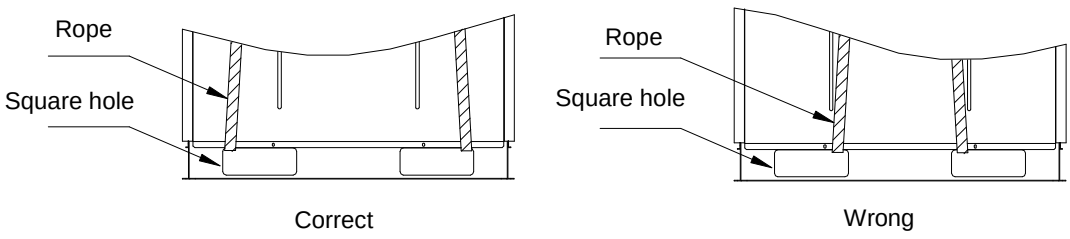
Never remove any packaging materials.

As shown, insert two ropes through the square holes on the machine and protect the machine with batten and corrugated paper.


Never remove the wood frame and plastic straps.
Rope
The angle between rope and machine shall be higher than 60°.
Tie the ropes the batten and corrugated paper with a thickness not over 15mm.
Do not apply any force to this board (both sides).
Insert the ropes through square hole.

◆ During lifting, the position of ropes is as shown below.

◆ Move the lower wood frame of the packaging box away and lift the unit to correct position.



3.1.1 Cautions for installation of side outdoor unit

To ensure good operation of the air conditioner, the selection of installing position must be in accordance with the following principles:

◆ The outdoor unit shall be so installed that the air discharged out of the outdoor unit will not flow back and that enough space shall be maintained around the machine for repair.

◆ The installing position shall be in good ventilation, so that the machine can breathe and exhaust

enough air. Ensure that there is no obstruction at the inlet and outlet of the machine. If any, please remove the obstructions blocking the air inlet and outlet.

- Also ensure that the outlet air and noise from the air conditioner will not affect the neighbors.
- The outdoor unit must be lifted by using the designated lift hole. During lifting, take care to protect the air conditioner and avoid knocking the metal parts, thus to prevent rusting in the future.
- Avoid direct sunshine as it might be.
- The installing position must be able to drain the rainwater and the water generated from defrosting.
- The installing position must ensure that the machine will not be buried in the snow or affected by the wastes or oil mist.
- To meet the noise and vibration requirements, the outdoor unit shall be installed by using rubber damping pad or spring damper.
- The installing dimension shall comply with the installation requirements in these instructions. The outdoor unit must be fixed at the installing position.
- The installation shall be done by specialist technicians.

3.1.2 Cautions for installation of up outdoor unit

To ensure good operation of the air conditioner, the selection of installing position must be in accordance with the following principles:

- The outdoor unit shall be so installed that the air discharged out of the outdoor unit will not flow back and that enough space shall be maintained around the machine for repair.
- The installing position shall be in good ventilation, so that the machine can breathe and exhaust enough air. Ensure that there is no obstruction at the inlet and outlet of the machine. If any, please remove the obstructions blocking the air inlet and outlet.
- Also ensure that the outlet air and noise from the air conditioner will not affect the neighbors.
- The outdoor unit must be lifted by using the designated lift hole. During lifting, take care to protect the air conditioner and avoid knocking the metal parts, thus to prevent rusting in the future.
- Avoid direct sunshine as it might be.
- The installing position must be able to drain the rainwater and the water generated from defrosting.
- The installing position must ensure that the machine will not be buried in the snow or affected by the wastes or oil mist.
- To meet the noise and vibration requirements, the outdoor unit shall be installed by using rubber damping pad or spring damper.
- The installing dimension shall comply with the installation requirements in these instructions. The outdoor unit must be fixed at the installing position.
- The installation shall be done by specialist technicians.

3.2 Selection of Installation Site

- The place with no residual air
- The place where the accessories can be securely fixed
- The place where the air will not obstruct the water inlet pipe or water outlet pipe
- The place that goes beyond the heating range of other heat sources
- The place where the wastewater can be safely drained
- The place where the noise and hot air will not affect the neighbors
- The place where the snow will not be piled
- The place where the water outlet pipe will not be blown by strong wind

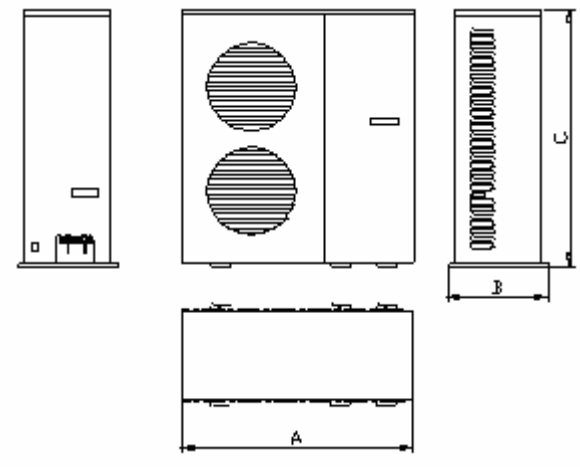
Notes:

- Do not use guardrail on four sides. Leave 1m at least above the machine.
- In case of short-circuit risk, please install an adaptor changeable in air direction.
- To avoid short circuiting, please provide adequate suction space when multiple machines are to be installed.
- In the region with snow, the machine shall be installed in a frame or beneath the snow guard, thus to prevent snow piling on the machine.
- Do not install the equipment in a region where any inflammable gas might leak.

* The snow guard and other devices shall be designed and installed by the user.

3.3 Dimensions Data

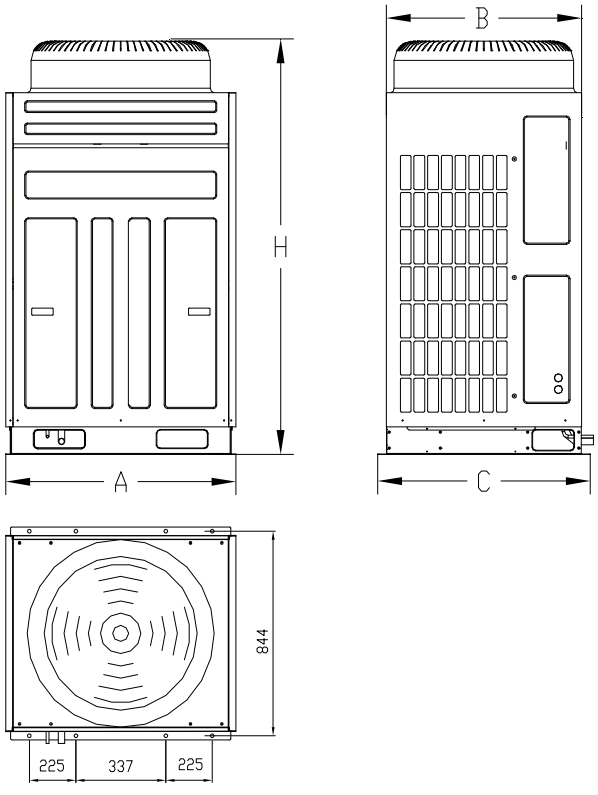
Appearance of GMV(L)-R120W/Na-K, GMV(L)-R160W/Na-M



Unit: mm

Model	A	B	C
GMV(L)-R120W/Na-K	1100	340	1250
GMV(L)-R160W/Na-M	1100	340	1250

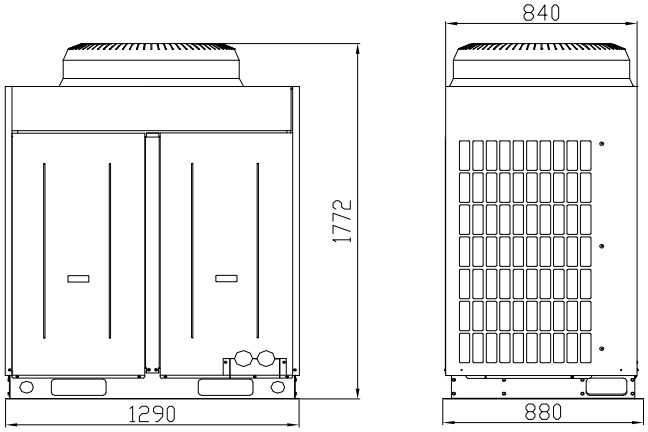
Appearance of GMV(L)-R260W2/Na-M, GMV(L)-R300W2/Na-M



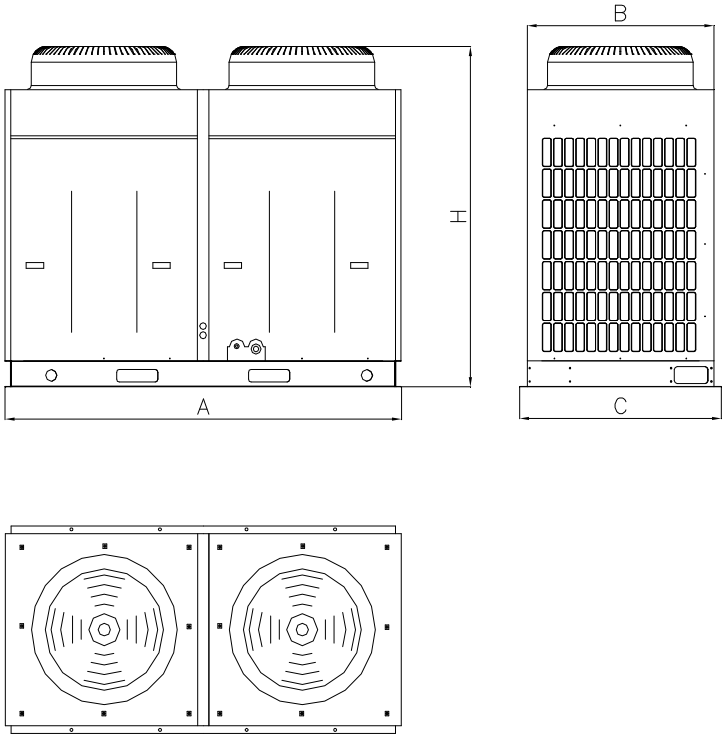
Unit: mm

Model	A	B	C	H
GMV(L)-R260W2/Na-M	990	840	880	1772
GMV(L)-R300W2/ Na-M	990	840	880	1772

Appearance of GMV(L)-R450W3/Na-M



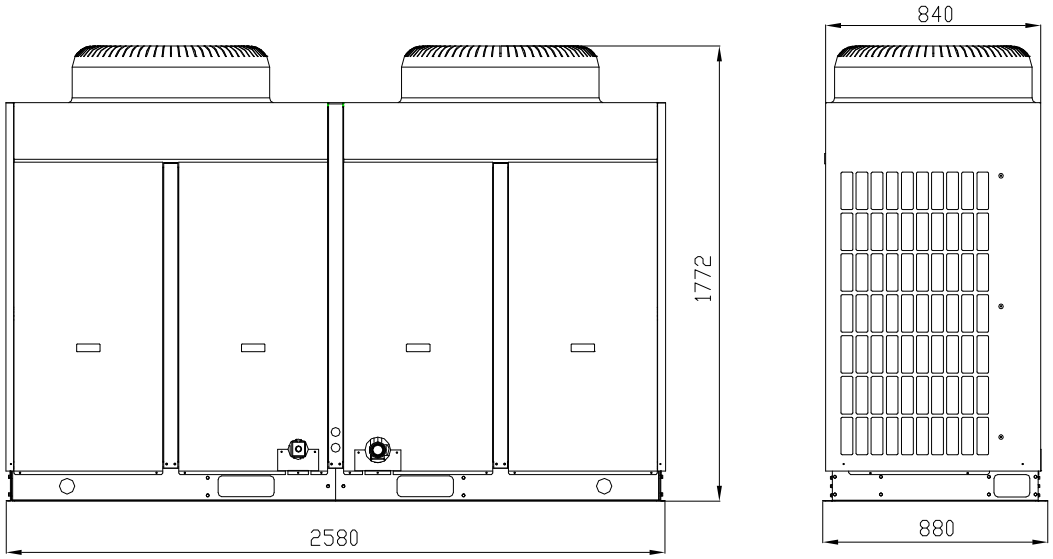
Appearance of GMV(L)-R560W4/Na-M, GMV(L)-R600W4/Na-M



Unit: mm

Model	A	B	C	H
GMV(L)-R560W4/Na-M	1980	840	920	1760
GMV(L)-R600W4/Na-M	1980	840	920	1760

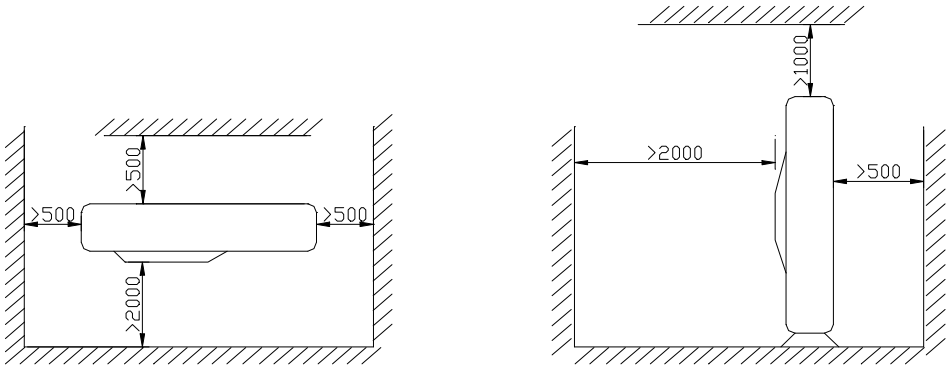
Appearance of GMV(L)-R860W6/Na-M, GMV(L)-900W6/Na-M



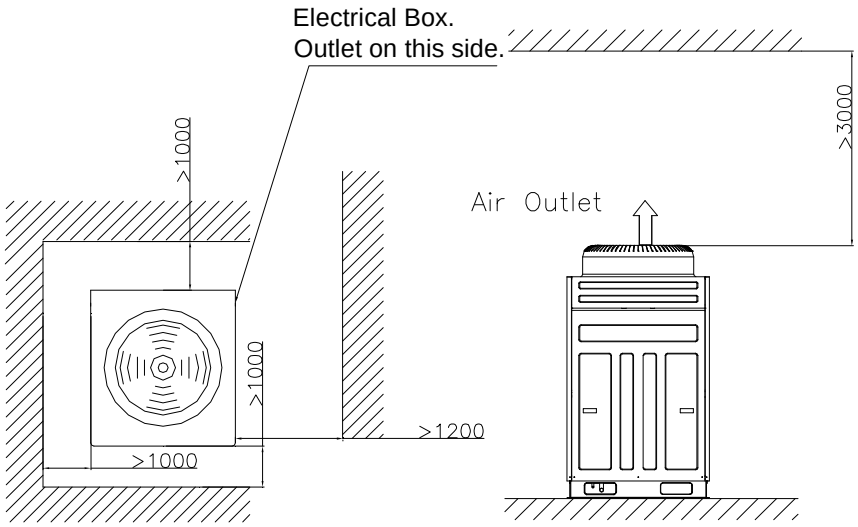
3.4 Installation Space Requirements

① Clearance data of single unit

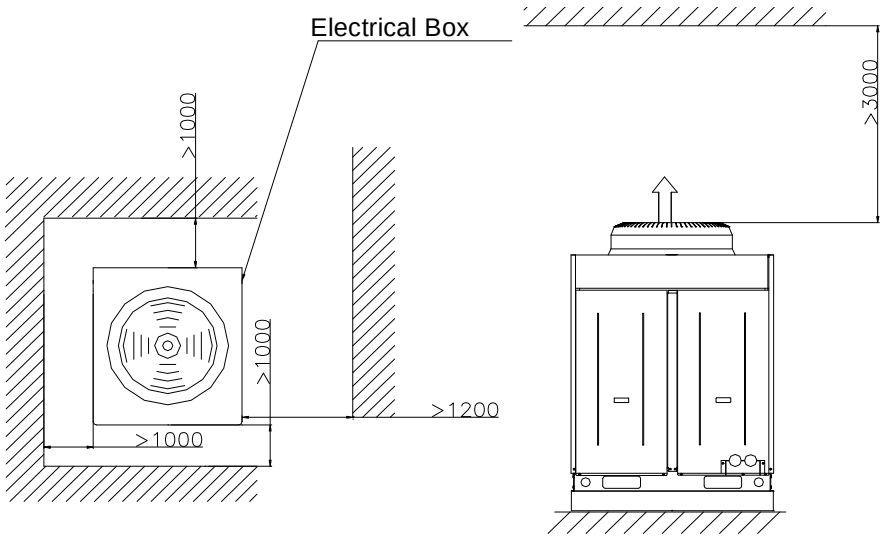
GMV(L)-R120W/Na-K, GMV(L)-R160W/Na-M Outdoor Unit Installation Space Dimension



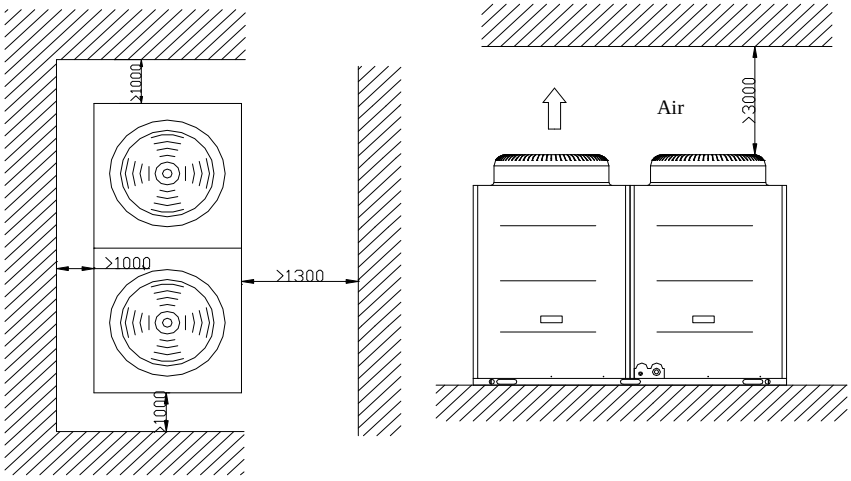
GMV(L)-R260W2/Na-M, GMV(L)-R300W2/Na-M Outdoor Unit Installation Space Dimension



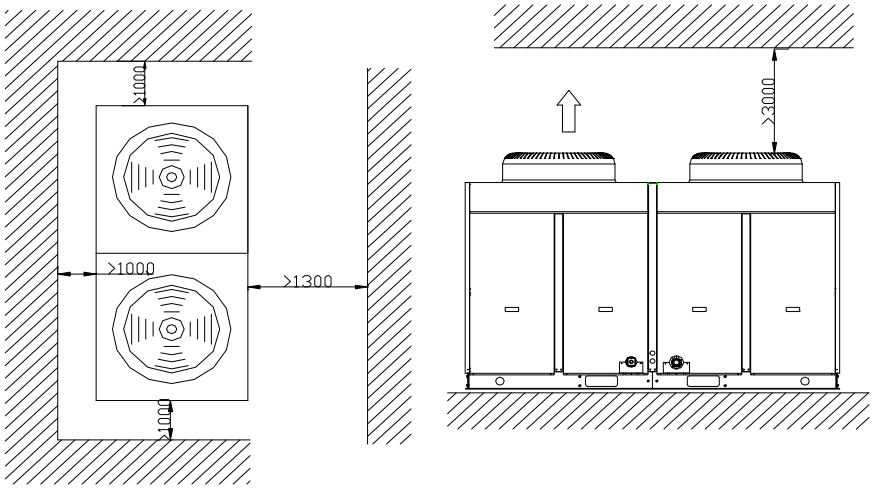
GMV(L)-R450W3/Na-M Outdoor Unit Installation Space Dimension



GMV(L)-R560W4/Na-M, GMV(L)-R600W4/Na-M Outdoor Unit Installation Space Dimension



GMV(L)-R900W6/Na-M Outdoor Unit Installation Space Dimension

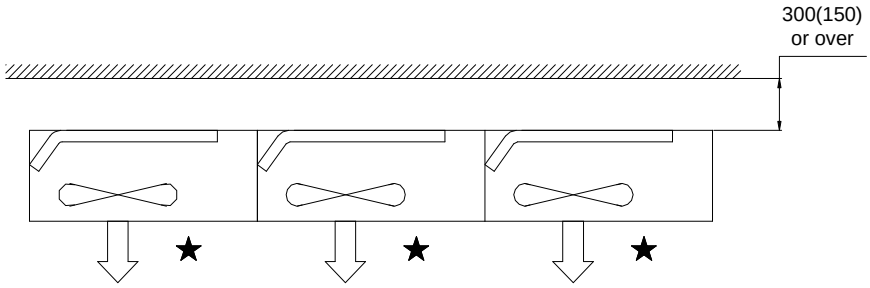


Outdoor unit shall be installed on a concrete base 10cm high.

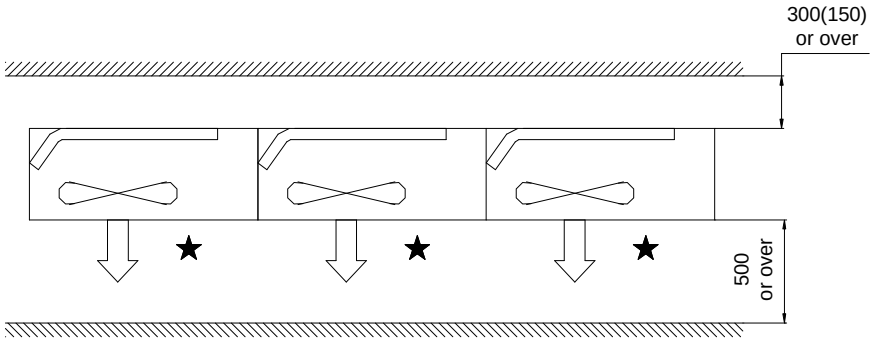
② Clearance data of multiple unit

★Arranged alongside on left and right

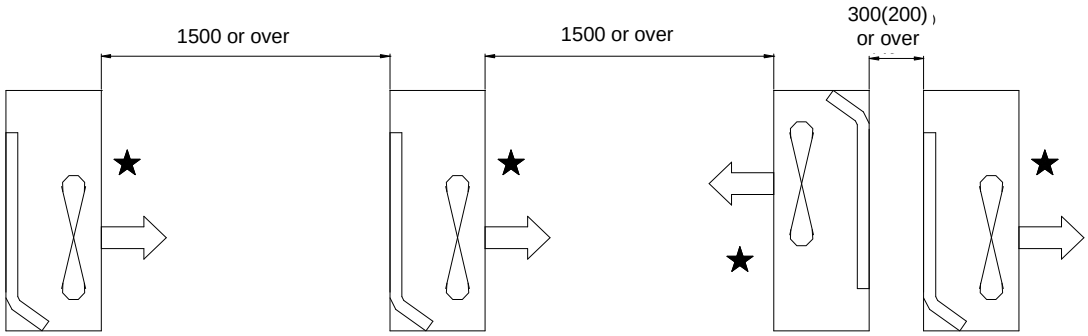
◆Air outlet side open



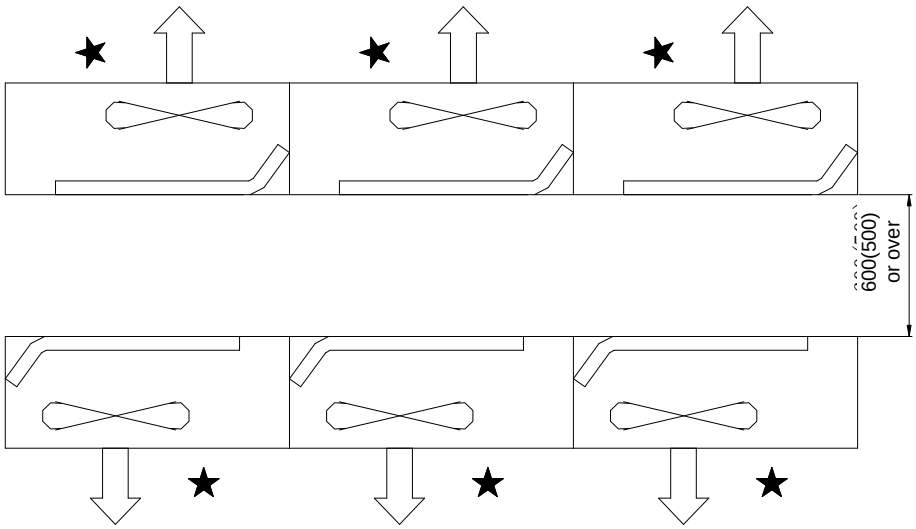
◆Obstructions on air outlet side



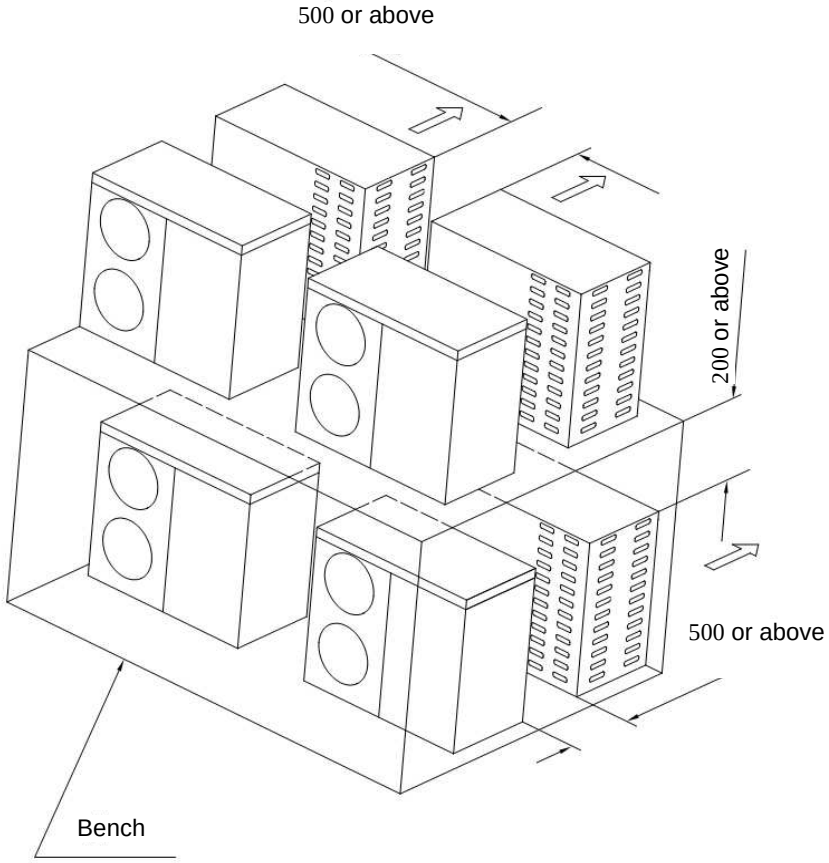
★Arranged on front and back



★Arranged alongside left / right and front / back

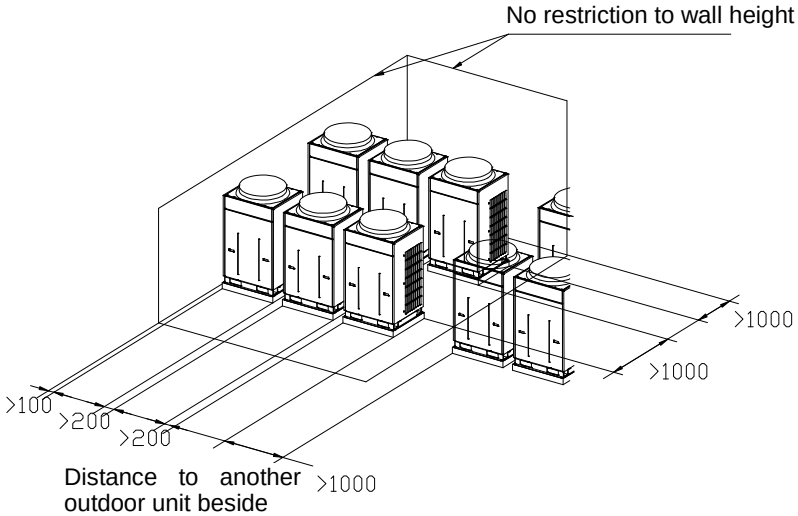


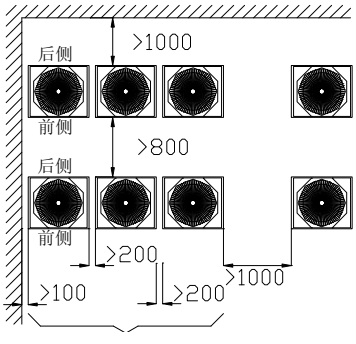
★Arranged by layer on upper and lower



To ensure good ventilation, the top of unit shall be kept open and free of any obstructions. In case that the front side and left side (or right side) of the outdoor unit is open space

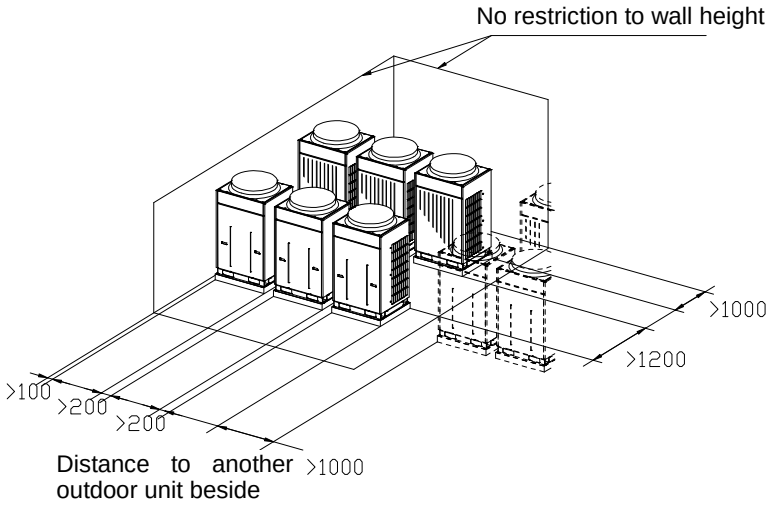
The unit shall be installed in the same direction.

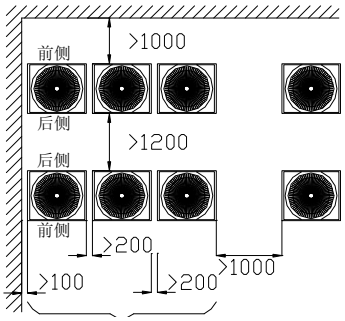




Max. three machines in line

Installed back against back

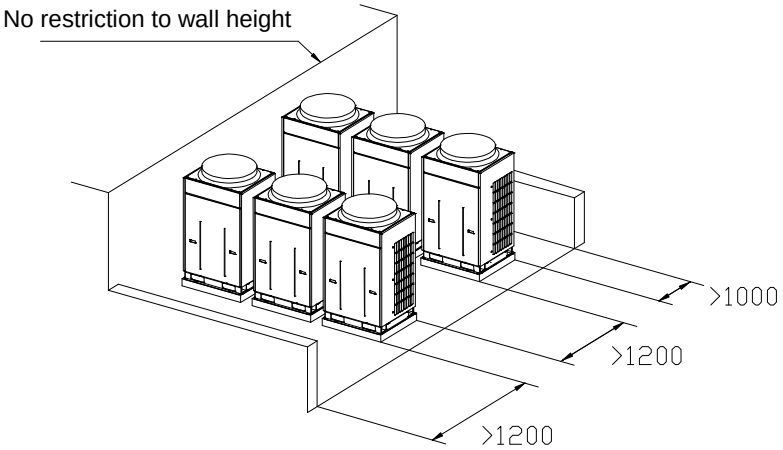


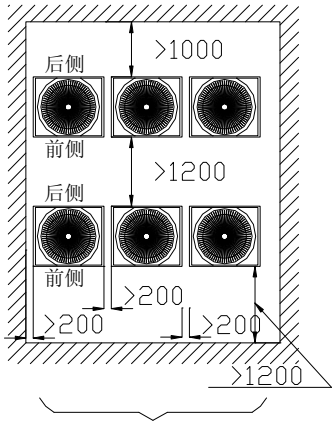


Max. three machines in line

In case there are walls on four sides of the outdoor unit:

It is suggested to install the unit in the same direction.

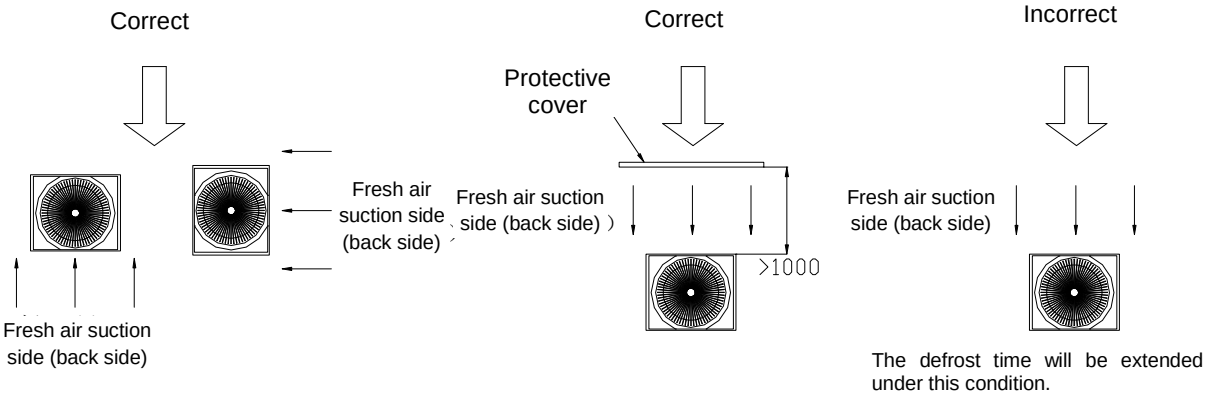




Max. three machines in line

3.5 Take Monsoons and Snow into Consideration

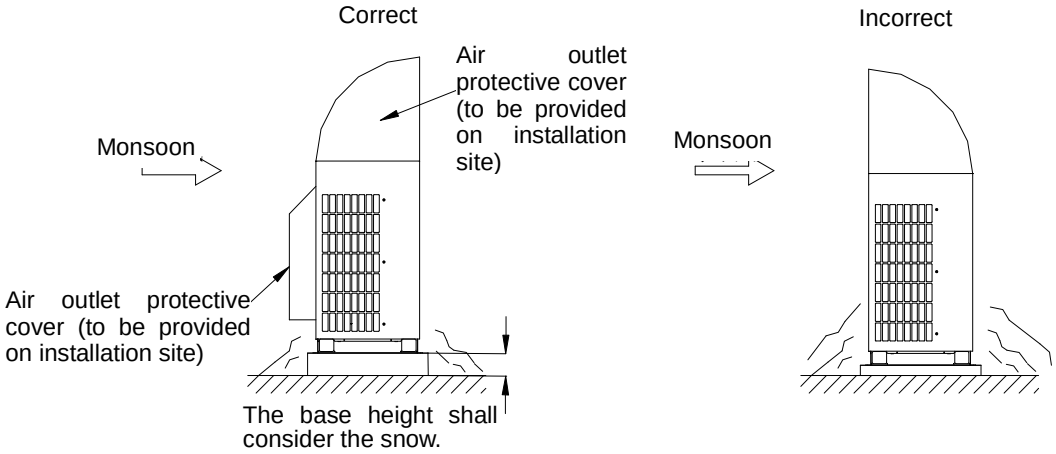
The monsoon shall be taken into consideration when installing the outdoor unit.



The defrost time will be extended under this condition.

The snow shall be taken into consideration when installing the outdoor unit.

To prevent the snow from covering the air outlet and air inlet, it is required to use an protective cover on air outlet and air inlet, and use a higher foundation base.


Correct
Air outlet protective cover (to be provided on installation site)
Monsoon
Air outlet protective cover (to be provided on installation site)
The base height shall consider the snow.
Incorrect
Monsoon

4 INSTALLATION OF INDOOR UNIT

4.1 Duct Type

4.1.1 Selection of installation site

● The selection of the installation place of the air conditioner unit

The installation must accord with the national and local safe criterion. Since the quality of installation would affect the operation directly, user should contact the seller and have the conditioner installed and tested by the professional install personnel according to the install instruction instead of install by himself/herself. Only connect the power after all the installation works are finished.

● The selection of the installation place of the indoor unit

☆ Prevent direct sun burn.

☆ Make sure that the top steeve, ceiling, and the structure of the construction etc. is strong enough to bear the weight of the unit.

☆ The drainage pipe is easy to drain.

☆ The air flow is not blocked at the outlet and intake vents.

☆ The connecting pipe indoor and outdoor can by lead to outside conveniently.

☆ The unit cannot be installed in the place where stored the flammability, easy exploded thing or the place where would have leakage of flammability and exploded gas.

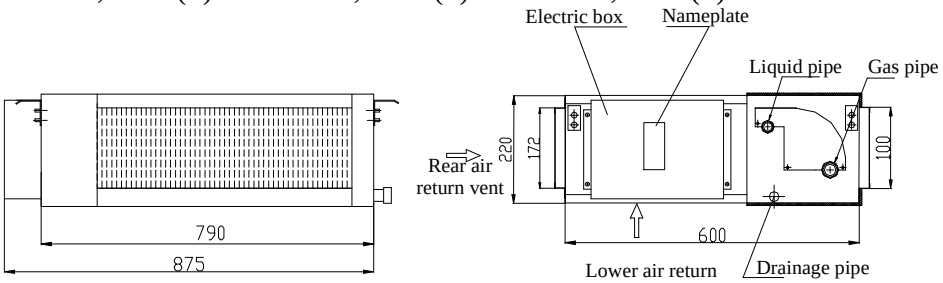
☆ The unit cannot be installed in the place where has the corrupt gas and serious dust, saline fog, lampblack and huge humidity.

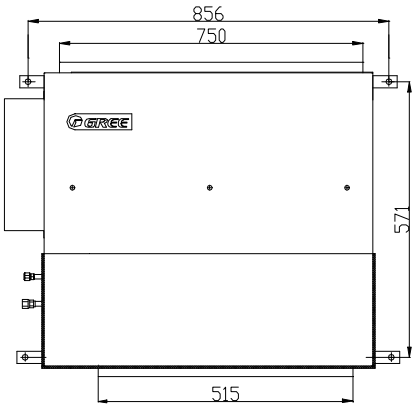
Note!

The air conditioner unit installed in the following place may have malfunction, if the malfunction cannot prevent, please contact the Nominated Repair Center Of Gree Electric Appliances, Inc. Of Zhuhai.

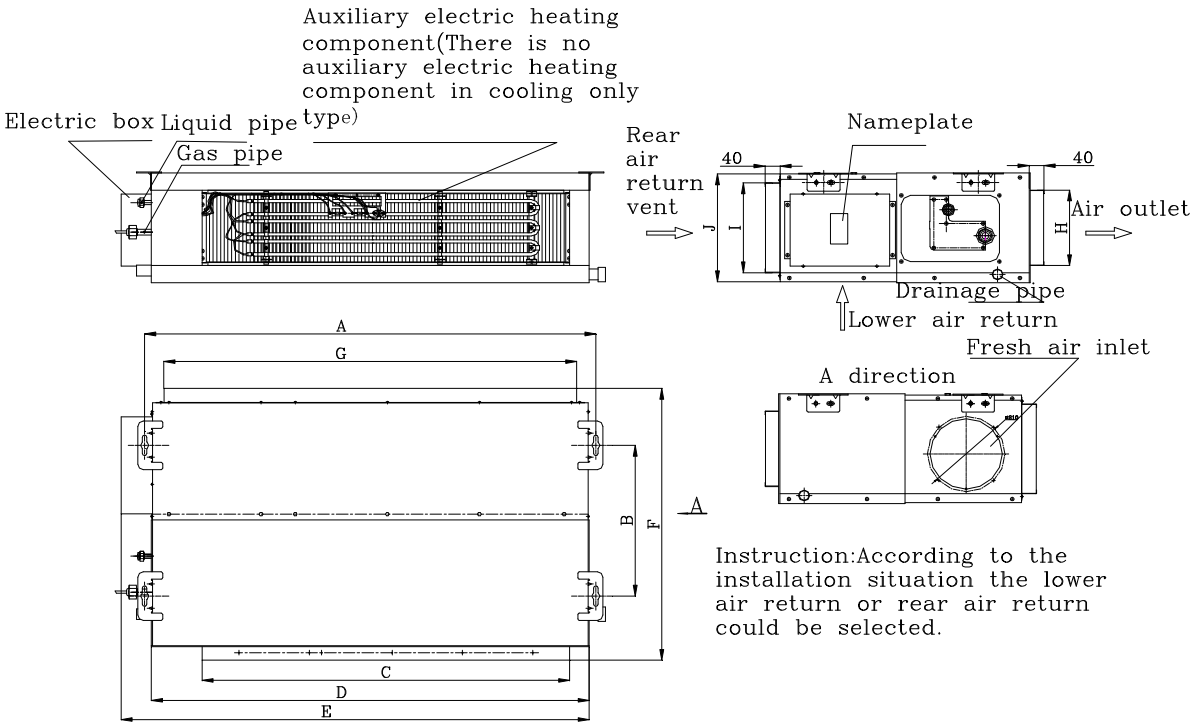
①the place with greasy all around; ②the seashore place with salinity and alkali; ③the place with vulcanized gas(such as vulcanized hot spring); ④the place with high frequency equipment (such as wireless equipment, electric welding machine and medical treatment equipment);⑤the place with special environment.

The following figure is applicable to the indoor units of
GMV(L)-R22P/Na-K, GMV(L)-R25P/Na-K, GMV(L)-R28P/Na-K, GMV(L)-R36P/Na-K





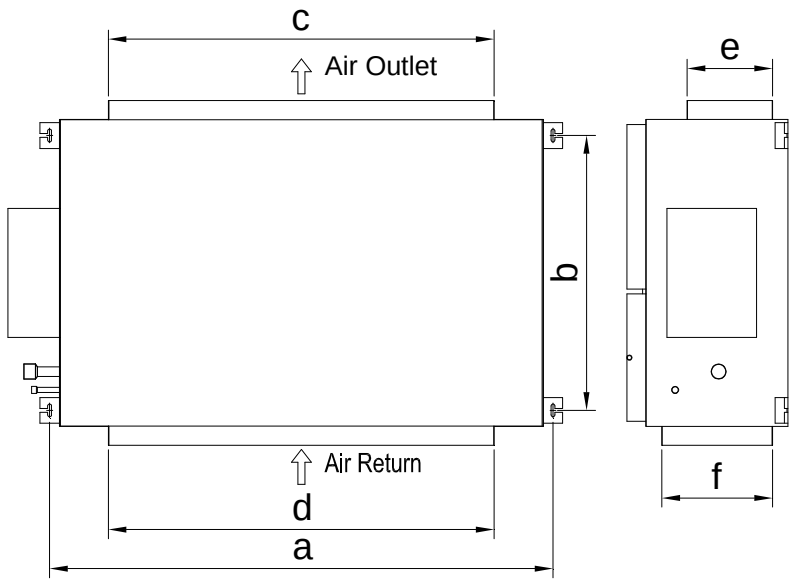
The following figure is applicable to the indoor units of GMV(L)-R45P/Na-K, GMV(L)-R50P/Na-K, GMV(L)-R56P/Na-K, GMV(L)-R63P/Na-K, GMV(L)-R71P/Na-K, GMV(L)-R80P/Na-K, GMV(L)-R90P/Na-K, GMV(L)-R112P/Na-K, GMV(L)-R125P/Na-K, GMV(L)-R140P/Na-K



Model	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
GMV（L）-R45P/ Na-K	932	430	738	904	980	736	738
GMV（L）-R50P/ Na-K	932	430	738	904	980	736	738
GMV（L）-R56P/ Na-K	1112	420	918	1070	1155	756	1008
GMV（L）-R63P/ Na-K	1112	420	918	1070	1155	756	1008
GMV（L）-R71P/ Na-K	1112	420	918	1070	1155	756	1008
GMV（L）-R80P/ Na-K	1112	420	918	1070	1155	756	1008

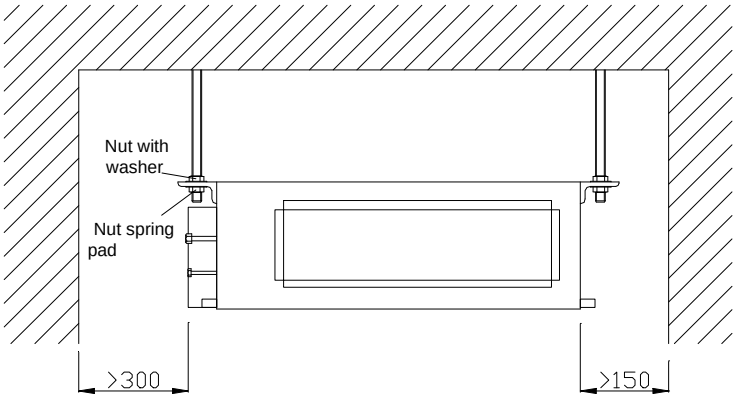
GMV（L）-R90P/ Na-K	1382	420	1155	1340	1425	756	1278
GMV（L）-R112P/ Na-K	1382	420	1155	1340	1425	756	1278
GMV（L）-R125P/ Na-K	1382	420	1155	1340	1425	756	1278
GMV（L）-R140P/ Na-K	1382	420	1155	1340	1425	756	1278

Model	H(mm)	I(mm)	J(mm)	Liquid pipe(inch)	Gas pipe(inch)	Drainage pipe（Outer ×Inner）
GMV（L）-R45P/ Na-K	125	207	266	φ1/4 "	φ1/2 "	φ30×φ27
GMV（L）-R50P/ Na-K	125	207	266	φ1/4 "	φ1/2 "	φ30×φ27
GMV（L）-R56P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV（L）-R63P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV（L）-R71P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV（L）-R80P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV（L）-R90P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV(L)-R112P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV(L)-R125P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27
GMV(L)-R140P/ Na-K	207	250	300	φ3/8 "	φ5/8 "	φ30×φ27



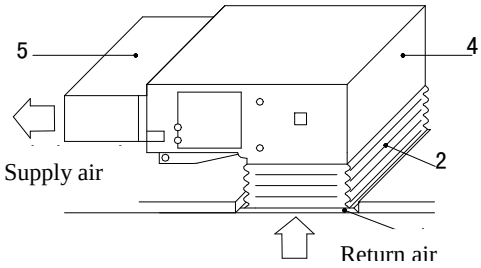
Model	a	b	c	d	e	f
GMV-R224P/ Na-M GMV-R280P/ Na-M	1560	910	1194	1194	292	342

4.1.3 Installation space requirements

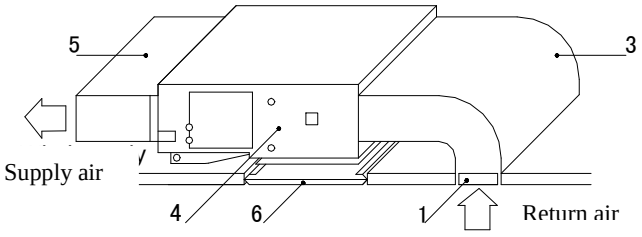


4.1.4 Installation demonstration

① Selection of style of return air



Install return air duct (a)

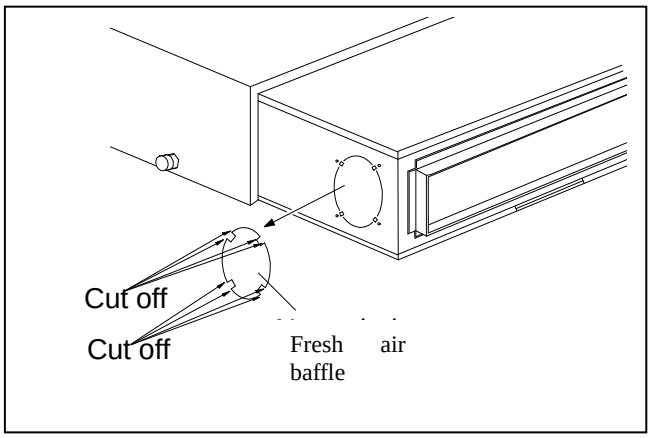


Install return air duct (b)

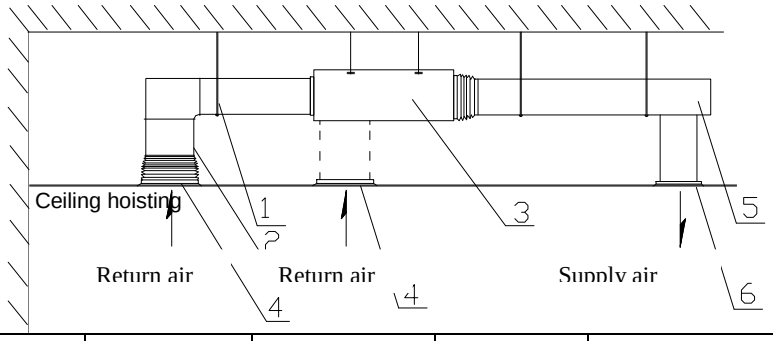
No.	Name	No.	Name
1	Return air inlet (with filter)	4	Indoor unit
2	Canvas air duct	5	Supply air duct
3	Return air duct	6	Test grill

② Installation of fresh air duct

1. When fresh air duct is need to be connected, cut the fresh air baffle as shown in fig.8. Plug up the gap of fresh air baffle by sponge if fresh air duct is not used.
2. Install the circle flange so that the fresh air duct can be connected as fig.9.
3. Well sealed and heat preservation should be done for both air duct and round air duct.
4. Fresh air should be the air after filtrate treatment.



③ Installation of air supply duct

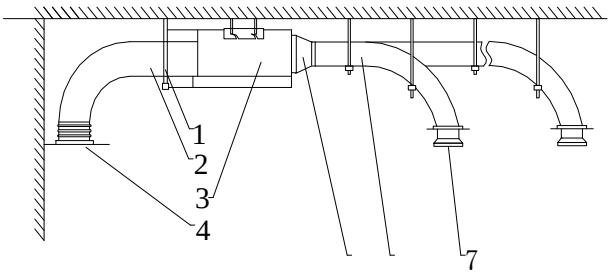


No.	1	2	3	4	5	6
Name	Hoisting	Return air duct	Ducted type indoor unit	Return air inlet	Supply air bent	Air outlet

Note: Fig.6 only shows the install of rear return air inlet, button return air inlet can also been installed according to the actual installation need. The method of installation is similar to the rear return air inlet's. The supply air duct, which is rectangle or circle and connect with the air inlet of the indoor unit, should at least keep one open. The circle air duct type should adopt circle preservation pipe to transmit cool (heat) air to room. The circle air duct should add a transitionary pipe, which size should match the size of air supply duct of the unit. After connecting the transitionary pipe, install the circle air outlet vent connection pipe, whose longest length to every individual air outlet vent should not over 10m. Ducted type indoor unit model 70 can share 3 trainsitional pipe, while model 100,120 can share 4. The transitional pipe, whose straight length is 200, and circle air outlet connection pipe, whose diameter is 200, produced by our company, can be ordered separately as standard fittings. Model 50 and the model below it do not share circle air duct. The following is the diagram for install circle air duct.

⚠ **Note: 1, The longest length of air duct means the general length of the wing supply pipe to the farthest air supply vent plus the general length of return air duct to the relative farthest return air vent.**

2, To the unit with auxiliary heater, if the circle air duct is need to connected, the straight length of transitional air duct should not shorter than 200mm.



Number	1	2	3	4	5	6	7
Name	Screw	Return air duct	Ducted type indoor unit	Return air inlet	Transitional air duct	Supply air duct	Air outlet

Setting hole for maintenance

After installation of hidden duct-type unit, manhole must be provided in ceiling on the electric box side of the indoor unit. In respect to the manhole, the following points must be taken into consideration:

- For access, the manhole size shall be larger than 500mm×500mm.
- The manhole must be at a possible easily accessible for repair of electric elements and pipe.
- The air inlet may also be used as manhole for repair of motor.

4.2 Cassette-type Unit

4.2.1 Selection of installation site

1. Obstruct should put away from the intake or outlet vent of the indoor unit so that the airflow can be blown though all the room.
2. Make sure that the installation had accord with the requirement of the schematic diagram of installation spaces.
3. Select the place where can stand 4 times of the weight of the indoor unit and would not increase the operating noise and oscillate.
4. The horizontally of the installation place should be guaranteed.
5. Select the place where easy drain condensated coagulated water, and easy connect with outdoor unit.
6. Make sure that there are enough space for care and maintenance. Make sure that the weight between the indoor unit and ground is above 1800mm.
7. When installing the steeve bolt, check if the install place can stand the weight 4 times of the unit's. If not, reinforce before installation. (Refer to the install cardboard and find where should be reinforced)

There will be lots of lampblack and dust stick on the acentric, heat exchanger and water pump in dining room and kitchen, which would reduce the capacity of heat exchanger, lead water leakage and abnormal operation of the water pump. **The following treatment should be taken under this circumstance:**

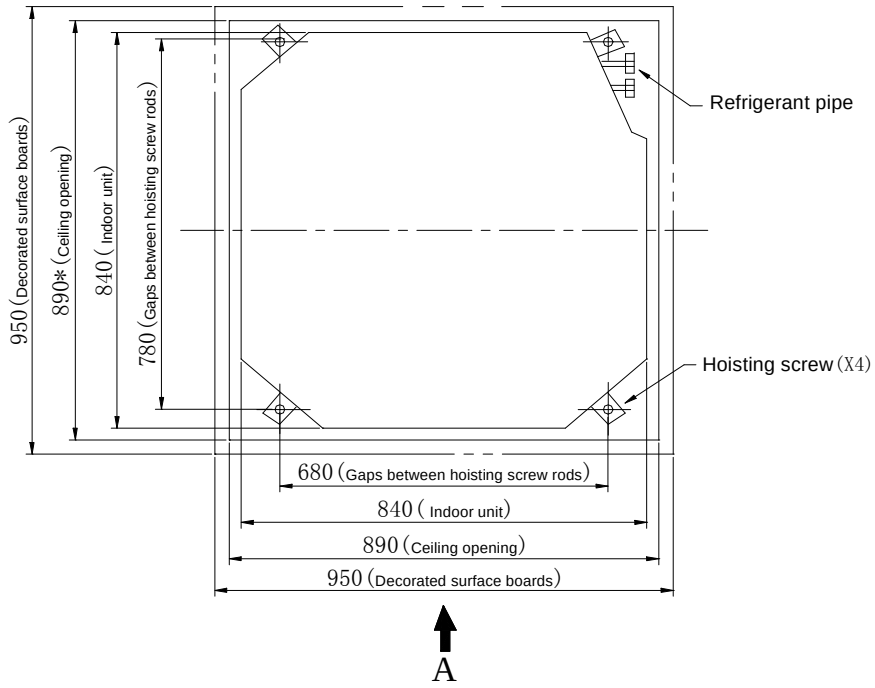
1. Ensure that the smoke trap above cooker has enough capacity to obviate lampblack to prevent the indraft of the lampblack by the air conditioner.
2. Keep the air conditioner far from the kitchen so that the lampblack would not be indraft by the air conditioner.

● Important notice:

- ◆ To guarantee the good performance, the unit must be installed by professional personnel according with this instruction.
- ◆ Please contact the local Gree special nominated repair department before installation. Any malfunction caused by the unit that is installed by the department that is not special nominated by Gree would not deal with on time by the inconvenience of the business contact.

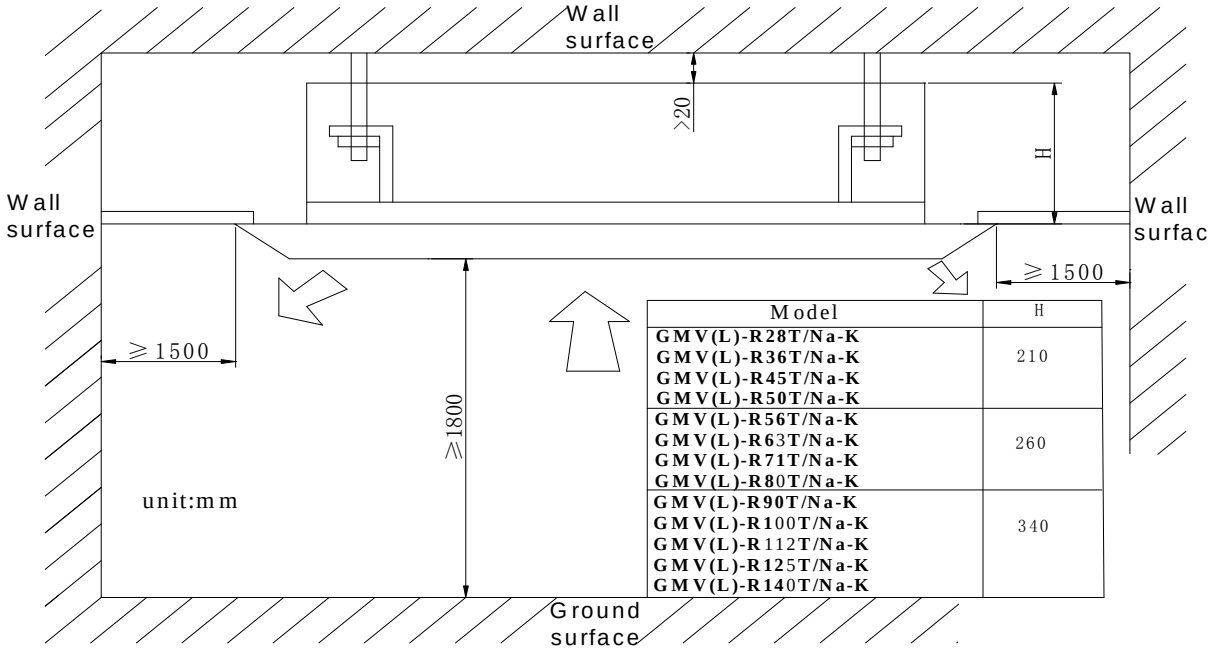
4.2.2 Dimensions Data

GMV(L)-R140T/Na-K, GMV(L)-R125T/Na-K, GMV(L)-R112T/Na-K, GMV(L)-R100T/Na-K, GMV(L)-R90T/Na-K, GMV(L)-R80T/Na-K, GMV(L)-R71T/Na-K, GMV(L)-R63T/Na-K, GMV(L)-R56T/ Na-K , GMV(L)-R50T/Na-K, GMV(L)-R45T/Na-K , GMV(L)-R36T/Na-K, GMV(L)-R28T/ Na-K



Package Dimension / Model	Width (mm)	Depth (mm)	Height (mm)
GMV(L)-R28T/Na-K	950	950	210
GMV(L)-R36T/Na-K	950	950	210
GMV(L)-R45T/Na-K	950	950	210
GMV(L)-R50T/Na-K	950	950	210
GMV(L)-R56T/Na-K	950	950	310
GMV(L)-R63T/Na-K	950	950	310
GMV(L)-R71T/Na-K	950	950	310
GMV(L)-R80T/Na-K	950	950	310
GMV(L)-R90T/Na-K	950	950	340
GMV(L)-R100T/Na-K	950	950	340
GMV(L)-R112T/Na-K	950	950	340
GMV(L)-R125T/Na-K	950	950	340
GMV(L)-R140T/Na-K	950	950	340

4.2.3 Installation space requirements



Model	H
GMV(L)-R28T/Na-K GMV(L)-R36T/Na-K GMV(L)-R45T/Na-K GMV(L)-R50T/Na-K	210
GMV(L)-R56T/Na-K GMV(L)-R63T/Na-K GMV(L)-R71T/Na-K GMV(L)-R80T/Na-K	260
GMV(L)-R90T/Na-K GMV(L)-R100T/Na-K GMV(L)-R112T/Na-K GMV(L)-R125T/Na-K GMV(L)-R140T/Na-K	340

4.2.4 Installation demonstration

1 The primary step for install the indoor unit.

☆ When attach the hoisting stand on hoisting screw, do use nut and gasket individually at the upper and lower of the hoisting stand to fix it. The use of gasket anchor board can prevent gasket break off.

2 Use install cardboard

☆ Please refer to the install cardboard about the dimension of ceiling opening.

☆ The central mark of the ceiling opening is marked on the install cardboard.

☆ Install the install cardboard on the unit by bolt (3 piece), and fix the angle of the drainage pipe at the outlet vent by bolt.

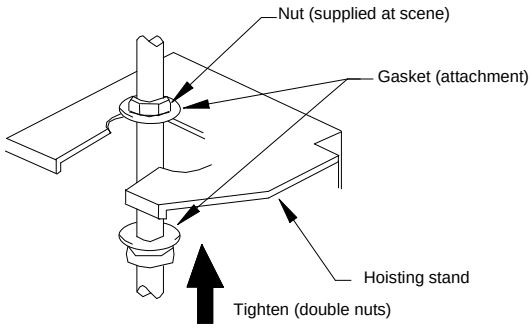
3 Adjust the unit to the suitable install place. (Refer to the fig.2)

4 Check if the unit is horizontal.

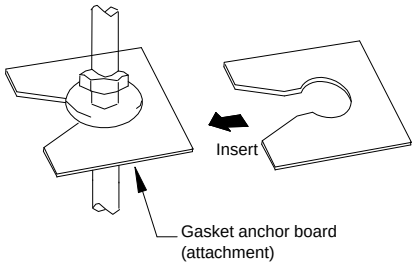
☆ Inner drainage pump and bobber switch are included in the indoor unit, check if 4 angle of every unit are horizontal by water lever. (If the unit is slant toward the opposite of the coagulate water flow, there may be malfunction of the bobber switch and lead water drop.)

5 Backout the gasket anchor board used to prevent gasket break off and tighten the nut on it.

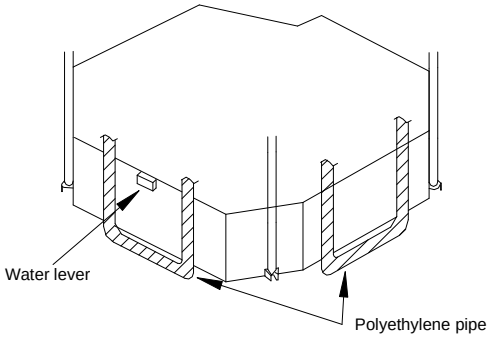
6 Backout the install cardboard.

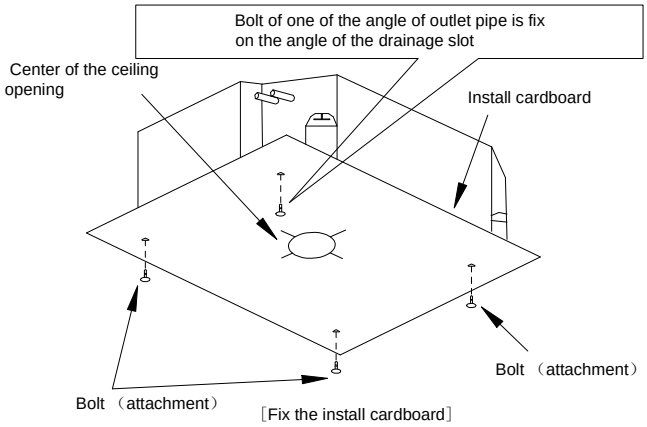


［Fix the hoisting stand firmly］



［Fix the gasket firmly］




Bolt of one of the angle of outlet pipe is fix
on the angle of the drainage slot
Center of the ceiling
opening
Install cardboard
Bolt （attachment）
Bolt （attachment）

［Fix the install cardboard］

Note!

- **Please do tighten the nuts and bolts to prevent air conditioner break off**.

● Connect the refrigerant pipe

☆ When connect the pipe to the unit or backout it from the unit, please do use both spanner and torque wrench. as shown in fig.3.

☆ When connect, smear both inside and outside of the flare nut with freeze motor oil, screw it by hand and then tighten it with spanner.

☆ Refer to form 1 to check if the wrench had been tightened (too tight would mangle the nut and lead leakage).

☆ Examine the connection pipe to see if it had gas leakage, then take the treatment of heat insulation, as shown in the fig.3.

☆ Only use median sponge to entwine the wiring interface of the gas pipe and heat preservation sheath of the gas collection tube.

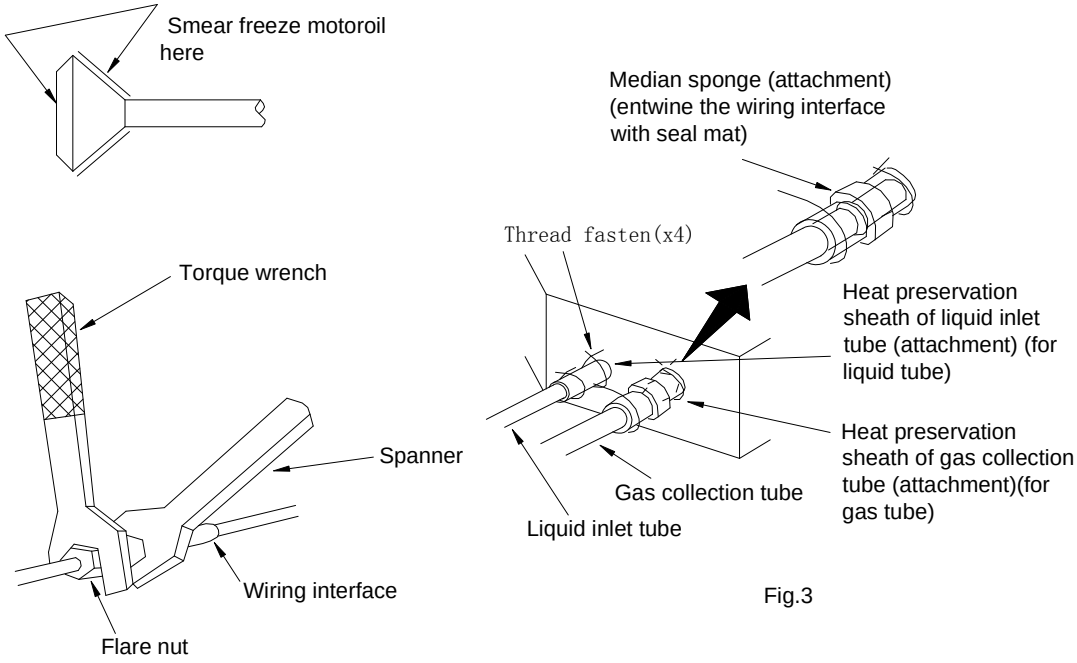

Smear freeze motoroil here
Median sponge (attachment) (entwine the wiring interface with seal mat)
Thread fasten(x4)
Torque wrench
Heat preservation sheath of liquid inlet tube (attachment) (for liquid tube)
Spanner
Heat preservation sheath of gas collection tube (attachment)(for gas tube)
Gas collection tube
Liquid inlet tube
Wiring interface
Flare nut

Fig.3

Form 1: The tightening torque needed for tightening nut

Diameter（Inch）	Surface thickness（mm）	Tightening torque (N.m)
φ1/4”	≥0.5	15-30 (N·m)
φ3/8”	≥0.71	30-40 (N·m)
φ1/2”	≥1	45-50 (N·m)
φ5/8”	≥1	60-65 (N·m)
φ3/4”	≥1	70-75 (N·m)

● Drainage hose

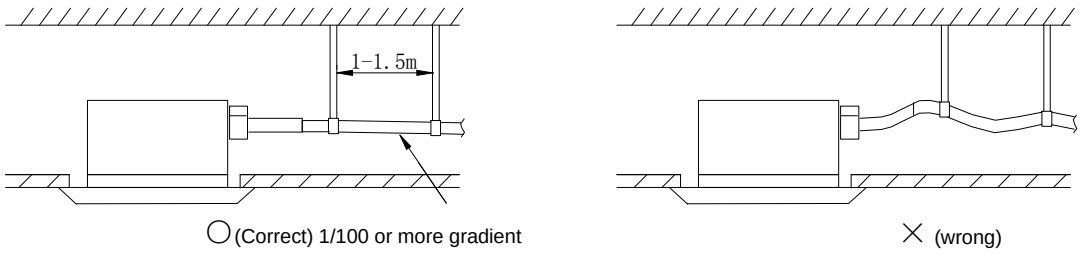
1. Install the drain hose

☆ The diameter of the drain hose should be equal or bigger than the connection pipe’s. (The diameter of polythene pipe: Outer diameter 25mm Surface thickness ≥1.5mm)

☆ Drain hose should be short and drooping gradient should at less 1/100 to prevent the formation of air bubble.

☆ If drain hose cannot has enough drooping gradient, drain raising pipe should be added.

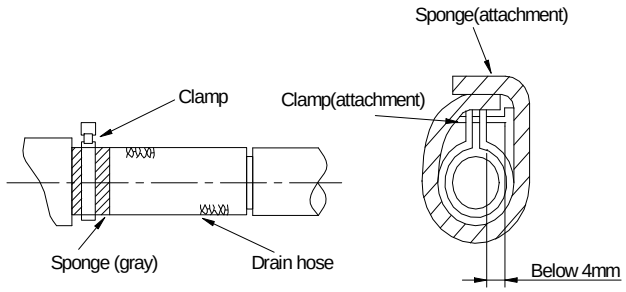
☆ To prevent bent of the drain hose, the distance between hoisting stand should is 1 to 1.5m.



☆ Use the drain hose and clamp attached. Insert the drain hose to the drain vent, and then tighten the clamp.

☆ Entwine the big sponge on the clamp of drain hose to insulate heat.

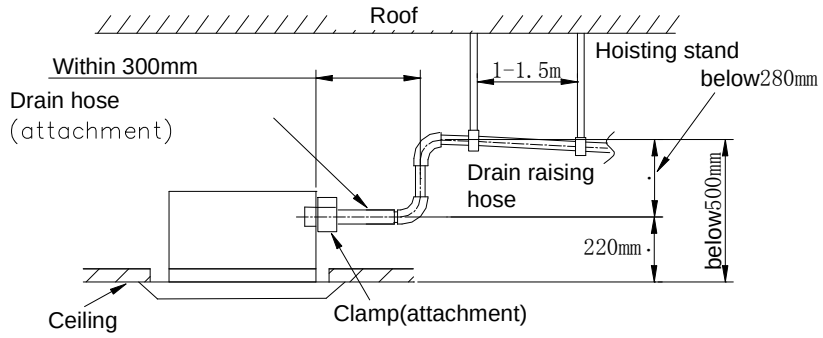
☆ Heat insulation should be done to indoor drain hose.



Drain stepup pipe note

☆ The install height of the drain raising pipe should less than 280mm.

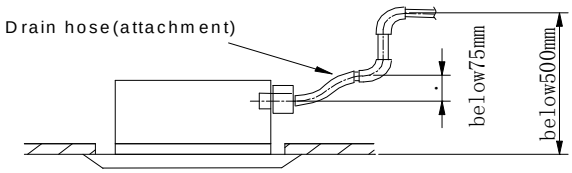
☆ The drain raising pipe should form a right angle with the unit, and distance to unit should not beyond 300mm.

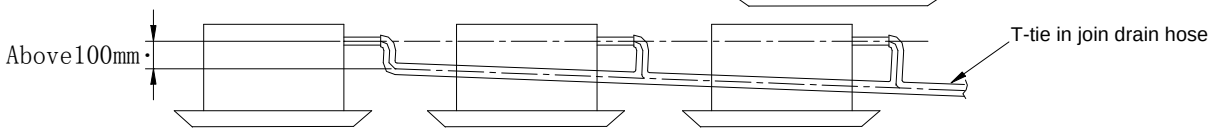


Instruction

☆ The slant gradient of the attached drain hose should be within 75mm so that the drain hole doesn't has to endure the unnecessary outside force.

☆ Please install the drain hose according to the following process if several drain hoses join together.





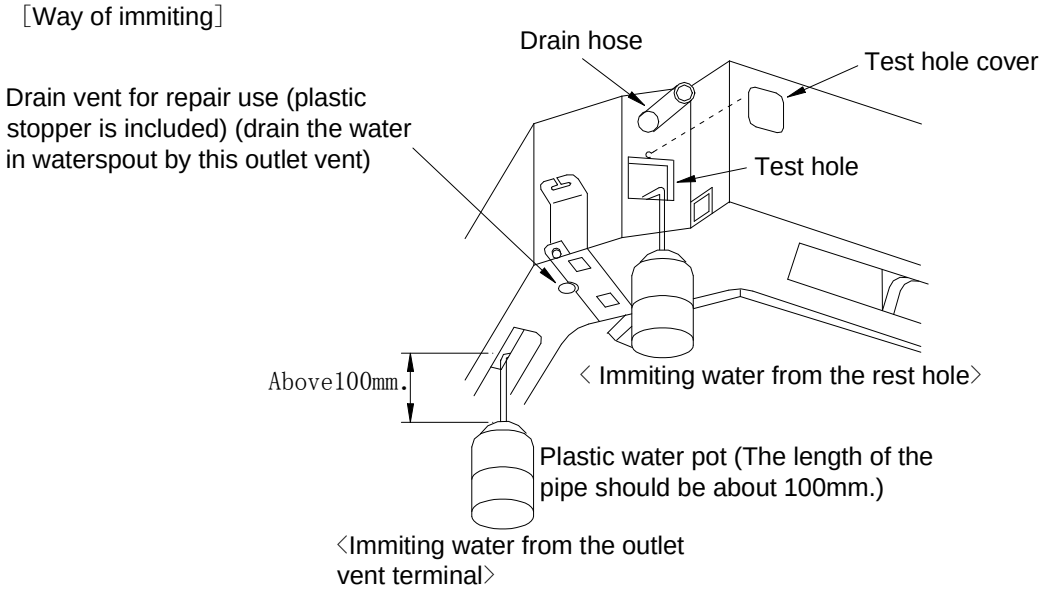
The specs of the selected join drain hose should fits the running capacity of the unit.

2 Check the smoothness of drain after installation.

☆ Check the drain state by immitting 600cc water slowly from the outlet vent or test hole.

☆ Check the drain in the state of refrigerating after installation of the electric circuit.

［Way of immiting］


Drain hose
Test hole cover
Drain vent for repair use (plastic stopper is included) (drain the water in waterspout by this outlet vent)
Test hole
Above100mm.
〈 Immiting water from the rest hole〉
Plastic water pot (The length of the pipe should be about 100mm.)
〈Immiting water from the outlet vent terminal〉

4.3 Floor Ceiling Type

4.3.1 Selection of installation site

Selection of Installation Location for Air Conditioner Unit

The installation of air conditioner unit must be in accordance with national and local safety codes. Installation quality will directly affect the normal use of air conditioner unit. The user is prohibited from installation by himself. Please contact your dealer after buying this machine. Professional installation workers will provide installation and test services according to installation manual.
Do not connect to power until all installation work is completed.

● Selection of Installation Location

☆ Such a place where cool air can be distributed throughout the room.

☆ Such a place where is condensation water is easily drained out.

☆ Such a place that can handle the weight of indoor unit.

☆ Such a place, which has easy access for maintenance.

☆ Such a place where is permitting easy connection with the outdoor unit.

☆ Such a place where is 1m or more away from other electric appliances such as television, audio device, etc.

☆ Avoid a location where there is heat source, high humidity or inflammable gas.

☆ Do not use the unit in the immediate surroundings of a laundry, a bath, a shower or a swimming pool.

☆ Be sure that the installation conforms to the installation dimension diagram.

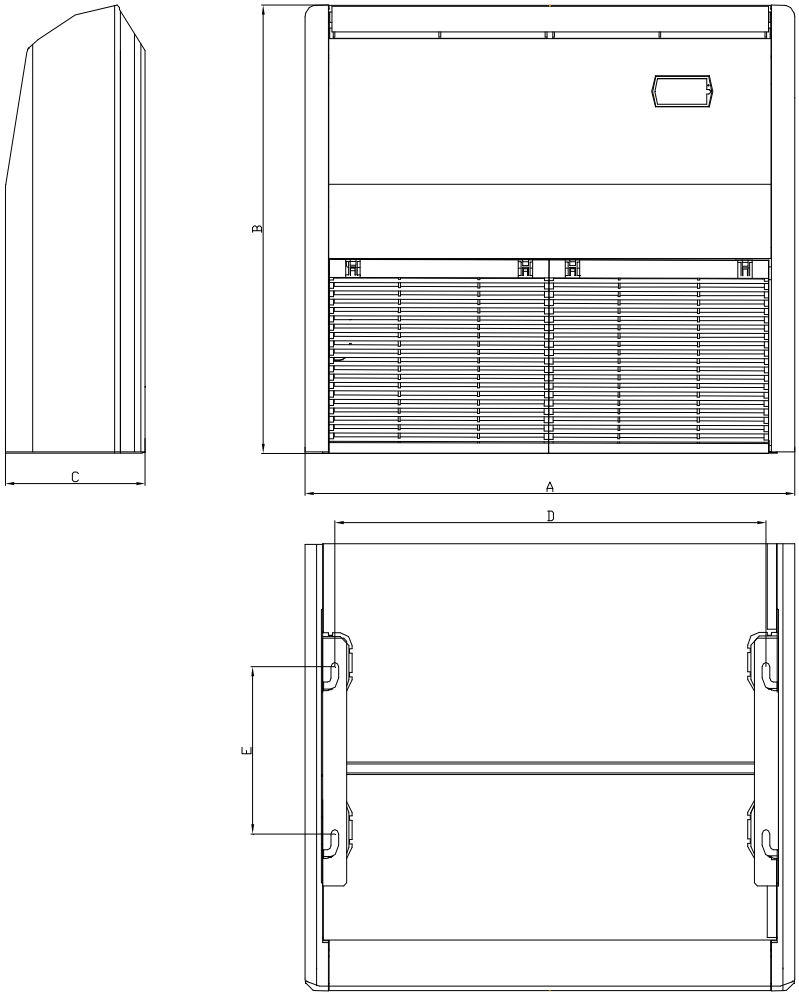
● Caution for installation where air conditioner trouble is likely to occur

☆ Where there is too much of oil.

☆ Where it is acid base area.

☆ Where there is irregular electrical supply.

4.3.2 Dimensions Data



Model	Installation dimensions		Outline dimensions		
	E	D	A	B	C
GMVL-R28Zd/Na-K GMV-R28Zd/Na-K	260	745	840	695	238
GMVL-R36Zd/Na-K GMV-R36Zd/Na-K	260	745	840	695	238
GM(L-R50Zd/Na-K GMV-R50Zd/Na-K	260	745	840	695	238
GMVL-R71Zd/Na-K GMV-R71Zd/Na-K	260	1220	1300	600	188
GMVL-R90Zd/Na-K GMV-R90Zd/Na-K	260	1500	1590	695	238
GMVL-R112Zd/Na-K GMV-R112Zd/Na-K	260	1500	1590	695	238
GMVL-R125Zd/Na-K GMV-R125Zd/Na-K	260	1500	1590	695	238

4.3.3 Installation space requirements

☆ The space around the unit is adequate for ventilation (Refer to Fig.1)

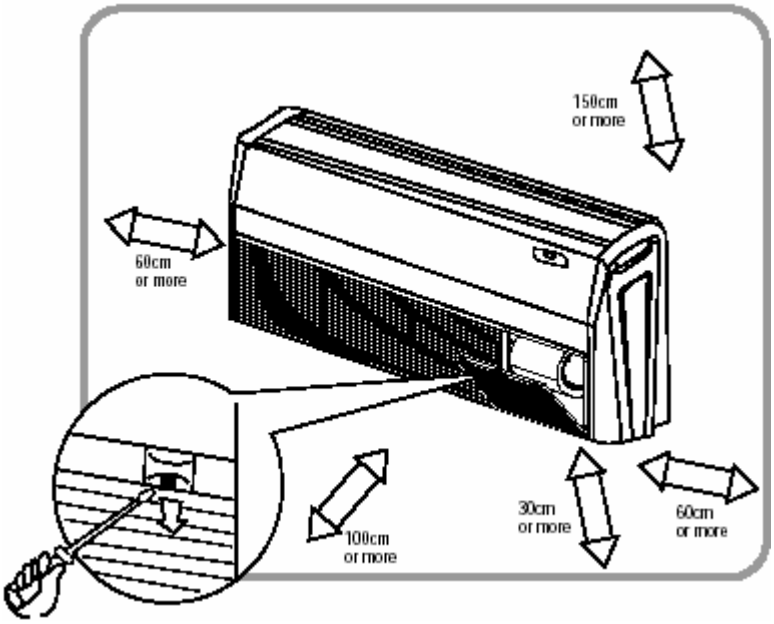


Fig.1

4.3.4 Installation demonstration

● **There are 2 styles of installation**

☆ **Ceiling type**

☆ **Floor type**

Each type is similar to the other as follows:

1. Determine the mounting position on ceiling or wall by using paper pattern to indicate indoor frame. Mark the pattern and pull out the paper pattern. (Refer to Fig.2)
2. Remove the return grill, the side panel and the hanger bracket from the indoor unit as per procedure bellow.

☆ Press the fixing knob of the air inlet grills, the grilles will be opened wider and then pull them out from the indoor.

☆ Remove the side panel fixing screw and pull to the front direction (arrow direction) to remove. Side panel fixing screw (Refer to Fig.3).

☆ Loosen two hanger bracket setting bolts (M8) on earth side for less than 10mm. Remove two hanger bracket fixing bolts (M6) on the rear side. Detach the hanger bracker by pulling it backward (Refer to Fig.5).

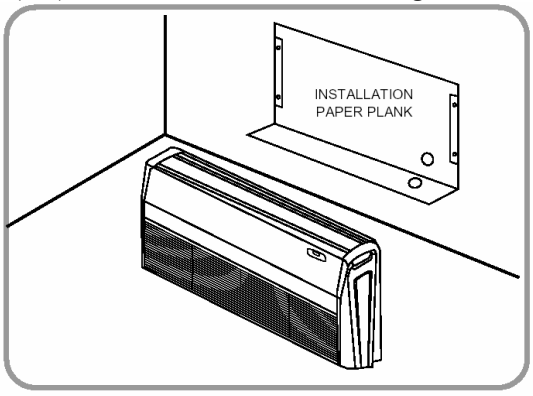


Fig.2

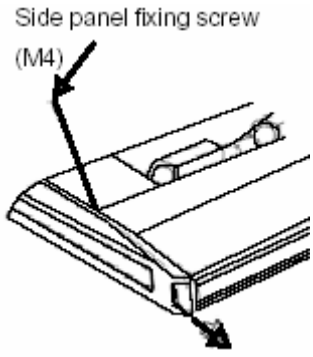


Fig.3

3. Set the suspension bolt. (Use W3/8 or M10 size suspension bolts)

☆ Adjust the distance from the unit to the ceiling slab beforehand (Refer to Fig.4)

4. Fix the hanger bracket to the suspension bolt.

Warning!

☆ Make sure that extended suspension bolt from the ceiling stays inside the arrowed position. Readjust the hanger bracket when it is outside the arrowed position. (Refer to Fig.6)

☆ Suspension bolt stays inside the cap of indoor unit. Never remove the cap.

5. Lift the unit and slide forward unit the dent. (Refer to Fig.7)

6. Screw tightly both hanger bracket-setting bolts (M8). (Refer to Fig.5)

7. Screw tightly both hanger bracket-fixing bolts (M6) to prevent the movement of the indoor unit. (Refer to Fig.5)

8. Adjust the height so that rear side of the drainpipe slightly inclines to improve drainage.

Caution!

☆ Adjust the height by turning the nut with a spanner.
Insert the spanner from the hanger bracket opening. (Refer to Fig.8)

In case of hanging

It is possible to install using inward facing hanger brackets by not removing the brackets from the indoor unit. (Refer to Fig.9)

Be sure to use only the specified accessories and parts for installation work.

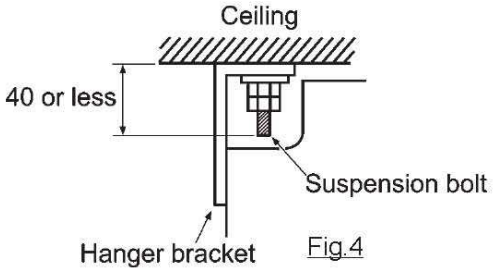


Fig.4

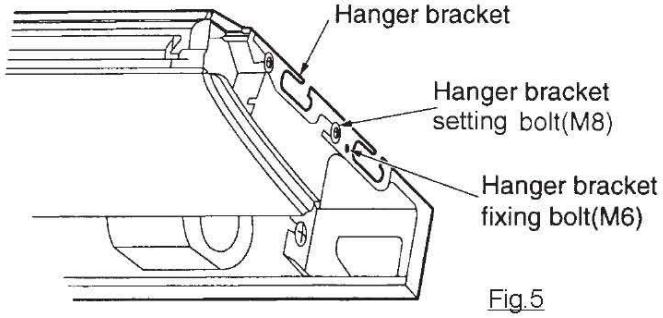


Fig.5

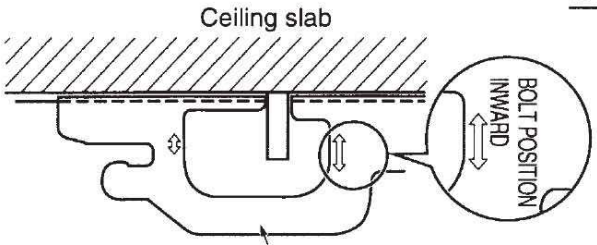


Fig.6

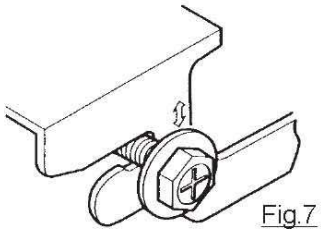


Fig.7

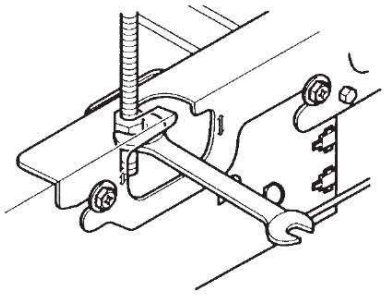


Fig.8

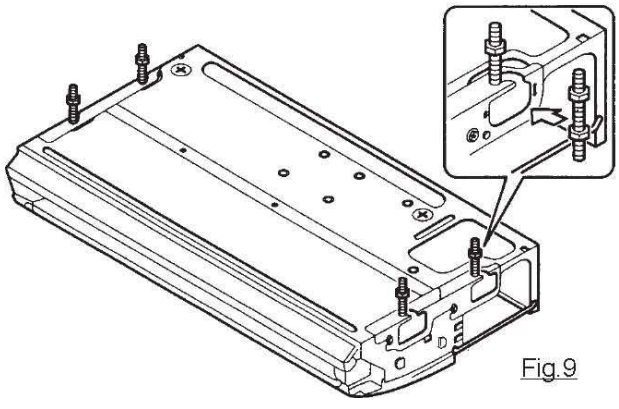
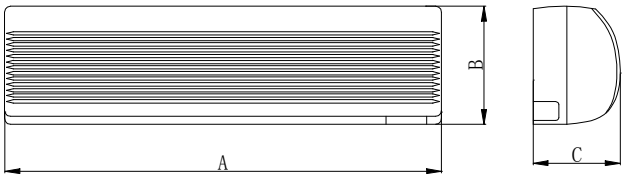


Fig.9

4.4 Wall mounted type

4.4.1 Dimensions Data



Remark :The appearance will be different according to the models.

Model	GMV(L)-R22G/NaA-K	GMV(L)-R28G/NaA-K	GMV(L)-R36G/NaA-K
A(mm)	830	830	830
B(mm)	285	285	285
C(mm)	189	189	189

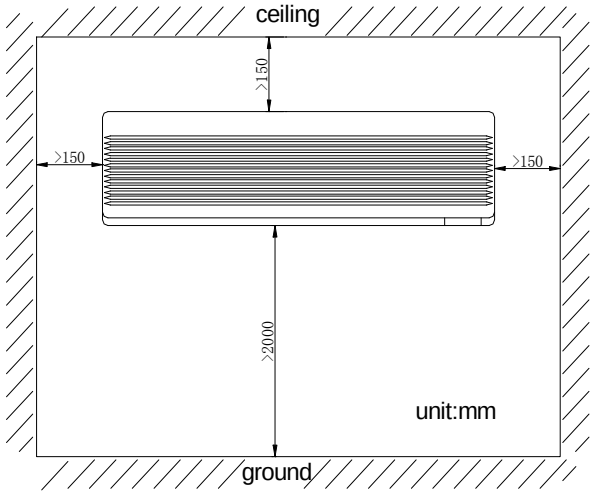
Model	GMV(L)-R22G/NaB-K GMV(L)-R22G/NaC-K	GMV(L)-R28G/NaB-K GMV(L)-R28G/NaC-K	GMV(L)-R36G/NaB-K GMV(L)-R36G/NaC-K	GMV(L)-R45G/NaB-K GMV(L)-R45G/NaC-K
A(mm)	770	770	830	830
B(mm)	250	250	285	285
C(mm)	190	190	189	189

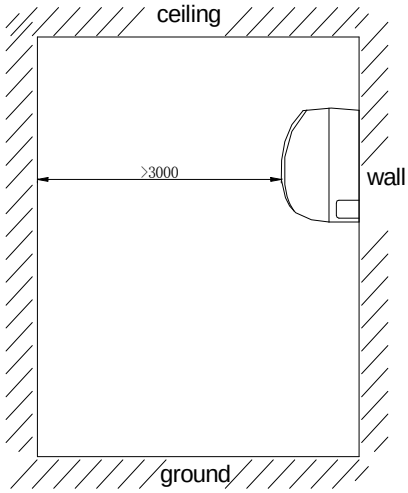
Model	GMV(L)-R50G/NaB-K	GMV(L)-R56G/NaB-K
A(mm)	1020	1020
B(mm)	310	310
C(mm)	228	228

Model	GMV(L)-R50G/Na-K	GMV(L)-R56G/Na-K	GMV(L)-R71G/Na-K	GMV(L)-R80G/Na-K
A(mm)	907	907	1178	1178
B(mm)	290	290	326	326
C(mm)	195	195	227	227

4.4.2 Installation space requirements

Schematic diagram of installation spaces





Important Notice:

- The unit must be installed by the professional personnel according to this installation instruction to ensure the well use.
- Please contact the local Gree special nominated repair department before installation. Any malfunction caused by the unit that is installed by the department that is not special nominated by Gree would not deal with on time by the inconvenience of the business contact.
- It should be guide under the professional personnel when the air conditioner unit is moved to other place.

4.4.3 Installation demonstration

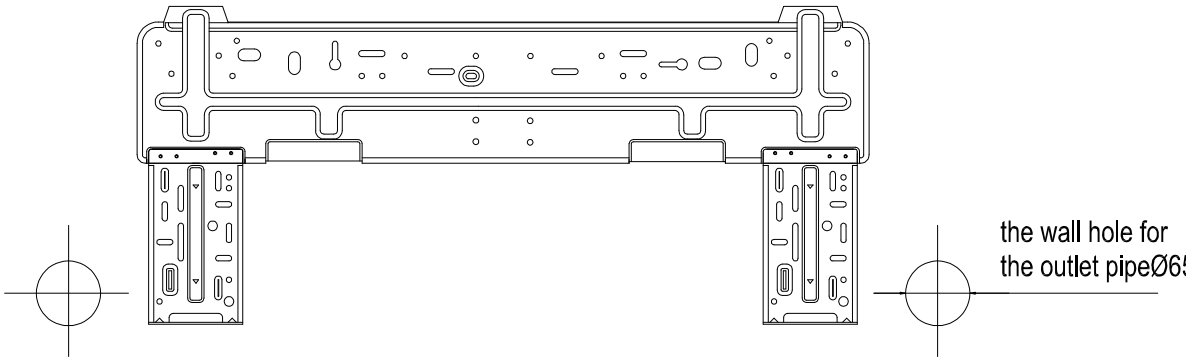


Fig.1

1. Find the horizontal position by seton method; since the drainage pipe is on the left side, adjust the rear panel to make its left side a little bit lower.

2. Fix the rear panel on the wall by bolt.

3. After installing the rear panel, pull it by hand to check if it is firm enough. The hang panel should support the weight of an adult (60KG), and the weight shared by every bolt for steady should be fairly even.

4. The diameter showed on the fig.1 is 65mm.

Installation the Wall Mounted Type indoor unit

☆ Make the piping hole (Φ65mm) in the wall at a slight downward slant to the outdoor side. The center of the hole should be determined refer to Fig.1

☆ Insert the piping-hole sleeve into the hole to prevent the connected piping and wiring from being damaged when passing through the hole.

● Install the drainage pipe

☆ For well draining, the drain hose should be placed at a downward slant.

☆ Do not wrench or bend the drain hose or flood its end bywater. (Fig.2)

☆ Wrap heat resistant material when connect the longer drainage tube though indoor.

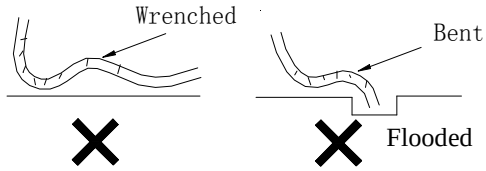


Fig .2

● Install the connection pipes

Connect the connect pipe with the two relative leading pipe, tie the nut on tie –in of the connect pipe tightly.

Note!

☆ Be careful in bending the connection pipes, or you will damage the pipes.

☆ If the tightening torque is too great in tightening the flare nut, leakage will happen.

5 INSTALLATION REQUIREMENTS OF REFRIGERANT PIPING

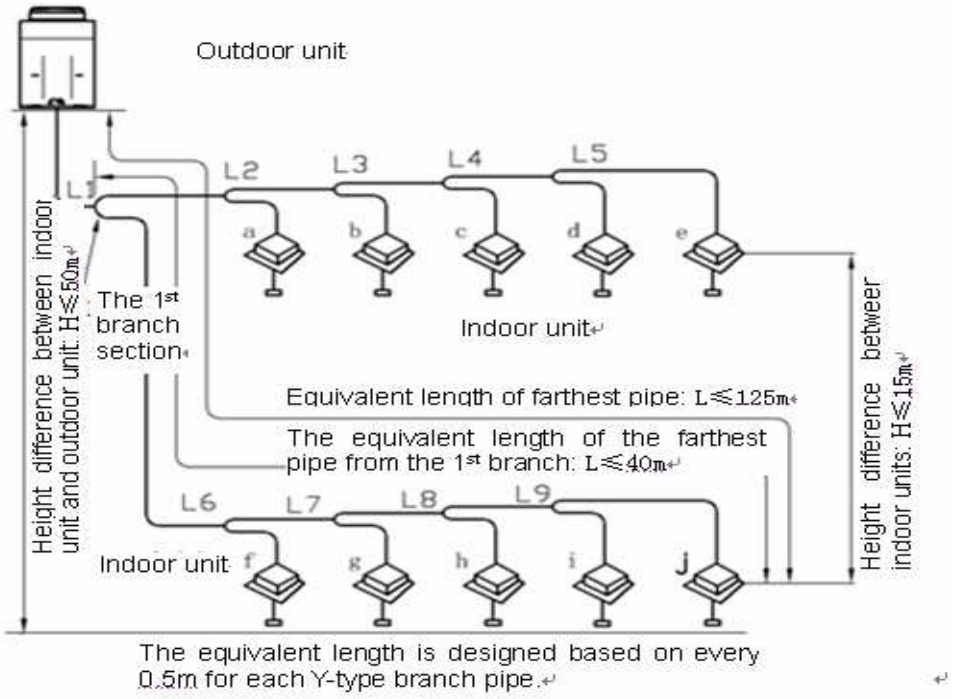
5.1 Specification

R410a refrigerant system			
External Diameter(mm/inch)	Thickness(mm)	External Diameter(mm/inch)	Thickness(mm)
φ6.35	≥0.8	φ22.2	≥1.5
φ9.52	≥0.8	φ25.4	≥1.5
φ12.7	≥1	φ28.6	≥1.5
φ15.9	≥1	φ34.9	≥1.5
φ19.05	≥1		

5.2 Allowable Length and Height Differences of the Refrigerant Piping between the Indoor and Outdoor Units

Capacity over 20KW

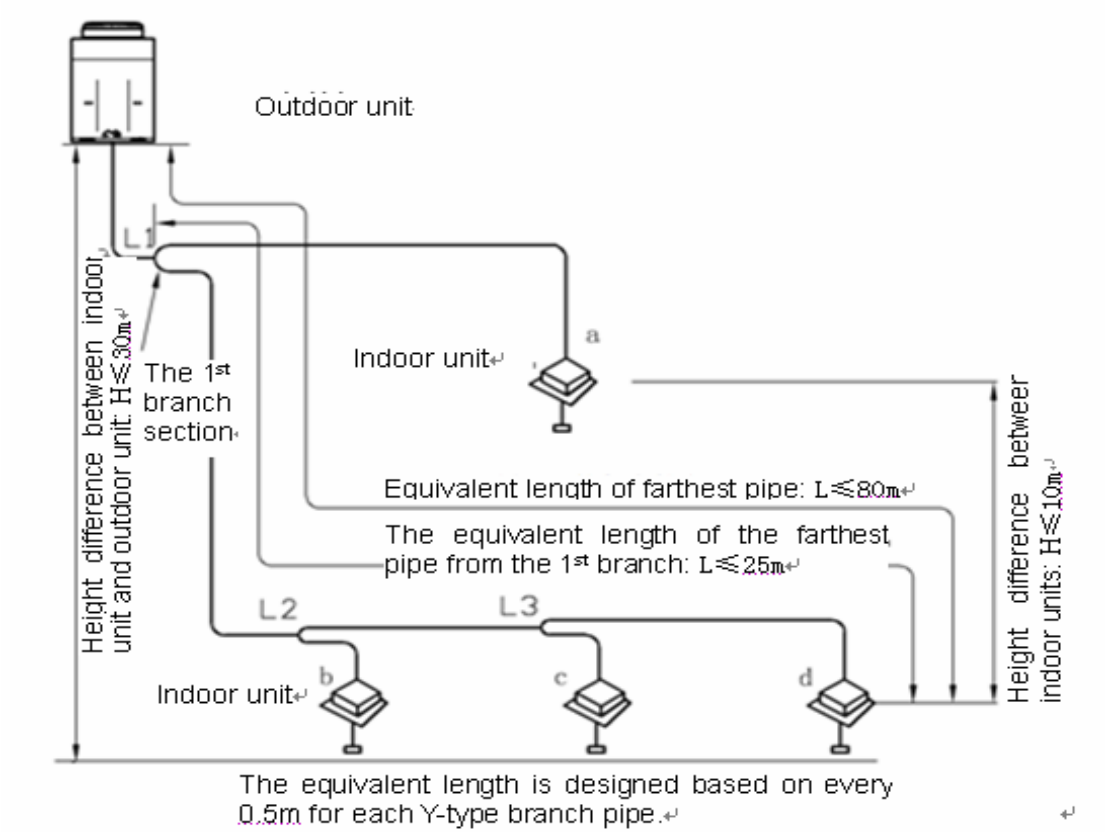
R410a refrigerant system		Allowable (m/ft) value	Fitting pipe
Total length (actual length) of fitting pipe		500/1640	$L_1+L_2+L_3+L_4+L_5+L_6+a+b+\ldots+i+j$
Length of the furthest fitting pipe	Actual length	500/1640	$L_1+L_3+L_4+L_5+L_6+j$
	Equivalent length	175/574	
Equivalent length of fitting pipe from the 1st branch joint to farthest indoor unit		40/131	$L_3+L_4+L_5+L_6+ j$
Height differences between indoor unit and outdoor unit	Outdoor unit at upper	50/164	-
	Outdoor unit at lower	40/131	-
Height differences between indoor units		15/49	-



Capacity lower than 20KW

R410a refrigerant system	Allowable (m/ft) value	Fitting pipe

Total length (actual length) of fitting pipe		300/984	$L_1+L_2+L_3+a+b++c+d$
Length of the furthest fitting pipe	Actual length	100/328	$L_1+L_2+L_3+d$
	Equivalent length	125/410	
Equivalent length of fitting pipe from the 1st branch joint to farthest indoor unit		25/82	L_2+L_3+d
Height differences between indoor unit and outdoor unit	Outdoor unit at upper	30/98	-
	Outdoor unit at lower	25/82	-
Height differences between indoor units		10/33	-


Outdoor unit
L1
Height difference between indoor unit and outdoor unit: H≤30m
The 1st branch section
Indoor unit
a
Equivalent length of farthest pipe: L≤80m
The equivalent length of the farthest pipe from the 1st branch: L≤25m
Height difference between indoor units: H≤10m
L2
L3
Indoor unit
b
c
d
The equivalent length is designed based on every 0.5m for each Y-type branch pipe.

5.3 Selection of Y-Type Branch Pipe

R410a refrigerant system	Total Capacity of the Downstream Indoor Unit (X)	Model
Y-Type Branch Pipe	X≤300	FQ01Na
	300<X≤600	FQ02Na

5.4 Selection of Diameter

① The diameter of the piping (the main pipe) from the Outdoor Unit to the first branch joint

R410a refrigerant system		
Outdoor capacity code C	Gas pipe (mm/inch)	Liquid pipe(mm/inch)
50<C≤140	Φ15.9	Φ9.52
140<C≤180	Φ19.05	Φ9.52
180<C≤320	Φ22.2	Φ9.52
320<C≤400	Φ25.4	Φ12.7
400<C≤480	Φ28.6	Φ12.7
480<C≤600	Φ28.6	Φ15.9

Note: When the actual pipe length exceeds 90m, the pipe diameter shall be increased accordingly.

② The diameter of the piping between branch joints (the branch pipe)

R410a refrigerant system		
Outdoor capacity code C	Gas pipe (mm/inch)	Liquid pipe(mm/inch)
C≤50	Φ12.7	Φ6.35
50<C≤140	Φ15.9	Φ9.52
140<C≤180	Φ19.05	Φ9.52
180<C≤320	Φ22.2	Φ9.52
320<C≤400	Φ25.4	Φ12.7
400<C≤480	Φ28.6	Φ12.7
480<C≤600	Φ28.6	Φ15.9

Note: When the actual pipe length exceeds 90m, the pipe diameter shall be increased accordingly.

③ The diameter of the piping from the branch joint (branch pipe) to the indoor unit

R410a refrigerant system		
Outdoor capacity code C	Gas pipe (mm/inch)	Liquid pipe(mm/inch)
22, 28 Type	φ9.52	φ6.35
36, 45, 50 Type	φ12.7	φ6.35
56, 63, 71, 80, 90, 10, 112 Type	φ15.9	φ9.52

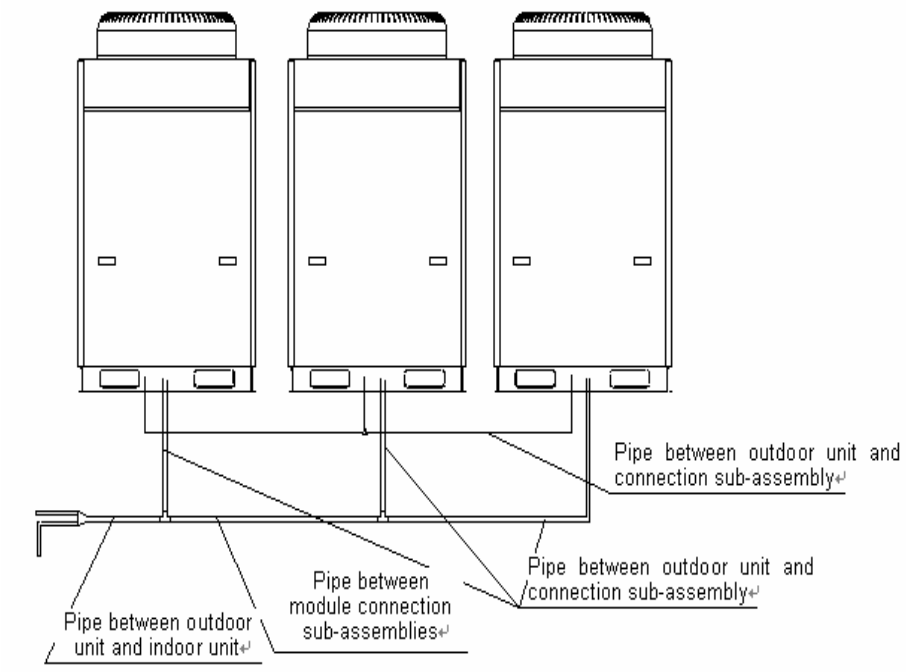
Note: When the actual pipe length exceeds 90m, the pipe diameter shall be increased accordingly.

5.5 Selection of Refrigerant Piping between Outdoor Unit and Outdoor Unit (for module unit)

1) Selection of components between module and module

Notes	Model	Name
Sub-assembly corresponding to outdoor module	ML01	ML01- Liquid pipe
		ML01- Gas pipe

2) Selection of pipe diameter between module and module


Pipe between outdoor unit and connection sub-assembly
Pipe between outdoor unit and connection sub-assembly
Pipe between module connection sub-assemblies
Pipe between outdoor unit and indoor unit

a Pipe diameter between outdoor unit and connection component

R410a refrigerant system		
Single module capacity code C	Gas pipe (mm/inch)	Liquid pipe(mm/inch)
C≤280	Φ22.2	Φ9.52
280<C≤400	Φ28.6	Φ12.7

b Pipe diameter between connection component of module and connection component of module

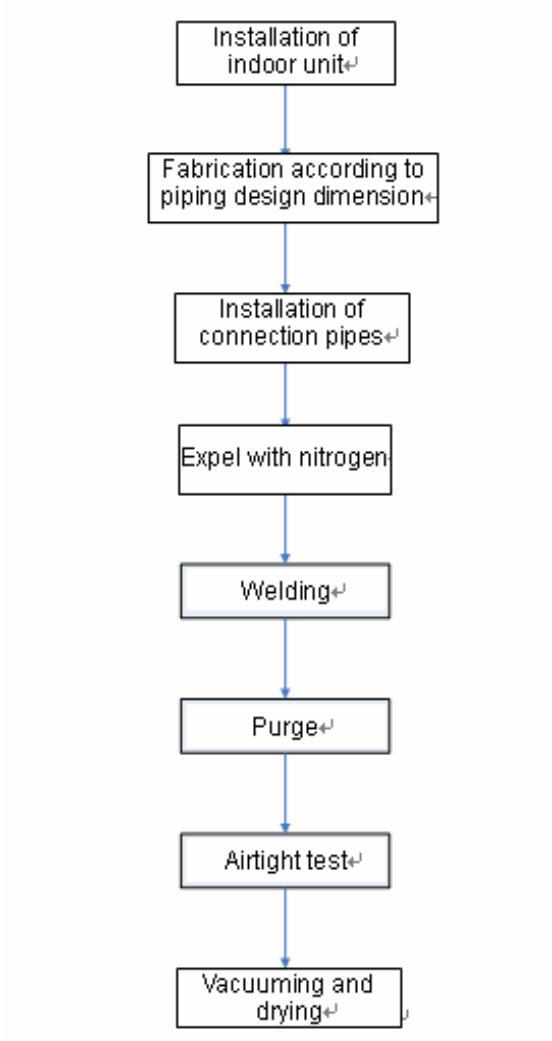
R410a refrigerant system		
Sum of capacity code of upstream module C	Gas pipe (mm/inch)	Liquid pipe(mm/inch)
C≤280	Φ22.2	Φ9.52
280<C≤450	Φ28.6	Φ12.7
450<C≤670	Φ28.6	Φ15.9
670<C≤950	Φ34.9	Φ19.1
950<C≤1350	Φ41.3	Φ19.1
C>1350	Φ41.3	Φ22.2

c Piping used for balancing lubricant

The oil balance pipe is connected by using Φ9.52 copper pipe. For three outdoor units arranged in parallel, one 3-way joint having an inner diameter of Φ9.7 shall be used in the oil balance pipe.

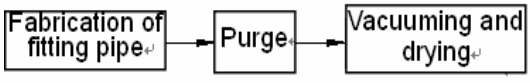
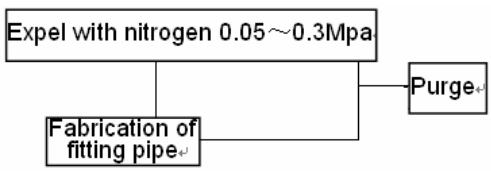
6 INSTALLATION OF REFRIGERANT PIPING

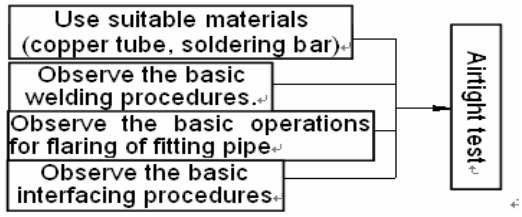
6.1 Flow Chart of Installation



6.2 Three Principles of Refrigerant Piping Installation

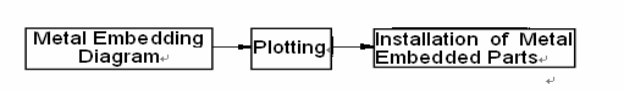
Keep to the three principles of refrigerant piping:

	Key Factors	Measures to Avoid Failure
Dry	● Invasion of outside water Example: Rainwater, engineering water ● Invasion of indoor condensate	
Clean	● Formation of oxides inside the pipe during welding ● Invasion of dust and foreign articles from outside	

Airtight	● Incomplete welding ● Leakage from flared port ● Leakage from edge	

6.3 Installation of Metal Embedded Pipe

◆ Work Order



Plot the line on ground if possible and use laser to project it onto the roof. This is quick and correct.

◆ Advance Installation of Metal Embedded Parts

Please select according to local codes

◆ Subsequent Installation of Expansion Bolts

In case that the metal embedded parts cannot be used due to design change, the expansion bolts may be used.

◆ Subsequent Installation of Expansion Bolts

● The foot pedal shall be supported on three points if exceeding 2m.

The foot pedal must be fixed securely to the ladder.

● Please do not work on the top of ladder.

6.4 Installation of Carriage of Refrigerant Piping

1）Fixing of horizontal pipe

The refrigerant pipe will extend and shrink with each start or stop of the air conditioner unit (5~10 times / hour). Under a temperature difference of 80℃, this extension may reach 13.84mm for every 10m. To prevent failure, the pipes must be reinforced as follows.

Spacing between supports

Outer diameter of pipe (mm)	6.35-8.52	Over 12.7
Spacing between supports (m)	Below 1.2	Below 1.2

Note: If the gas pipe and liquid pipe are suspended together, the size of liquid pipe shall prevail.

⚠ CAUTION:

Never let the pipe in direct contact with the fixing metal parts. Thermal insulation shall be provided around the fixing metal parts; otherwise, condensing will occur.

2）Fixing of vertical pipe

The vertical pipe may be fixed by using the commodity tools in market or self-made tools. As above, the fixing point shall also be thermally insulated.

3）Fixing of other points

Measures shall be taken to prevent the extension or shrinkage of pipes from causing excessive loads to

some positions, machine joint and waterproof points. Generally, such positions refer to the branch pipe joint, pipe ends, four sides of indoor unit and wall-cross hole.

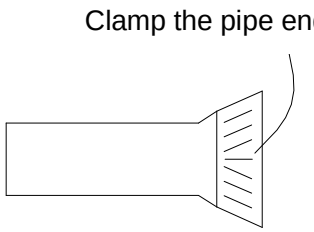
6.5 Management and Machining of Refrigerant Piping

1）Storage

- After receiving the refrigerant pipe and other components, do not move them to the storage until confirming that they have no deformation, bend, crack or damage.
- The pipe end must be sealed to prevent the invasion of moisture or wastes.
- The copper pipe with coating may become deformed under the compression of the coating material, so that the coils shall be placed upright.
- To avoid the invasion of moisture or wastes, a support higher than the ground must be built by using woods.
- Care of pipe end during construction

The pipe ends must be well cared during construction. According to the working position, work progress and surrounding environment, the most effective way is to seal the end and wrap with adhesive tape.

i. Sealing method



Clamp the pipe end to flat and weld on the clearance. Then, charge nitrogen 2～5kgf/cm^2. This will be more effective.

ii. Method for wrapping with adhesive tape

Seal the pipe end with ethylene tape.

2）Coil unwinding

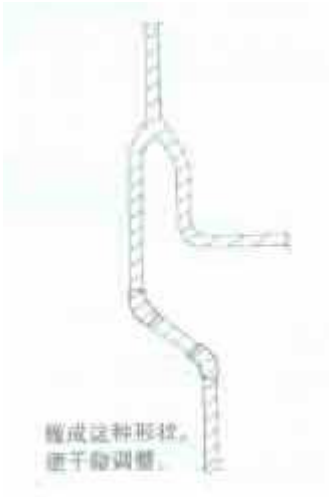
⚠ CAUTION:

- When unwinding the coil, take care not to drag it on the ground. The coil shall be slowly unwound on ground without any twisting. In case of excessive compression by any hard object during unwinding, the thermal insulation materials may be damaged and cannot be recovered, which will deteriorate the performance of thermal insulation. Do not unwind carelessly. Otherwise, the fitting pipe might be flattened.
- The copper pipe shall be rounded if the pipe end is deformed.

(The higher the size, the higher the possible deformation)

3）Measuring of pipe

- (To reduce the resistance and length of copper pipe), the dimension of main refrigerant pipe shall be so taken that the bends shall be minimized, the radius of bend section shall be increased and the upstream and downstream section shall be reduced. Use the method that can reduce the actual length and equivalent length of the copper pipe.
- Sometimes the connection pipe of indoor unit must be adjusted due to the relation with accessories, drainage pipe and connection surface. Therefore, a fairly marginal dimension shall be taken.



4）Cut·Chamfer

◆ Cut

a) Cut vertically to axis direction by using special pipe cutter that is suitable to the dimension of copper pipe (big, medium, small).

b) During operation, press and rotate the pipe cutter slowly and cut off the copper pipe without causing any deformation.

Never use saw or grinding wheel, because the copper scraps may be left inside the pipe. Even use of such tools once will make all works scrapped. It is useless no matter how good the quality of other works. It is best that all operators shall have one pipe cutter and at least one pipe cutter of big dimension shall be provided on site.

⚠ CAUTION:

To prevent the invasion of water or waste, avoid placing the copper pipe directly on ground.

◆ Chamfer

Burrs may occur on the cutting face of copper pipe and must be removed. Meanwhile, purge the foreign articles out of the pipe and refinish the pipe end.]

● Use scraper or other tools to remove the burrs on inner side.

(To prevent copper scraps from falling into the pipe, please keep the pipe end downward during operation).

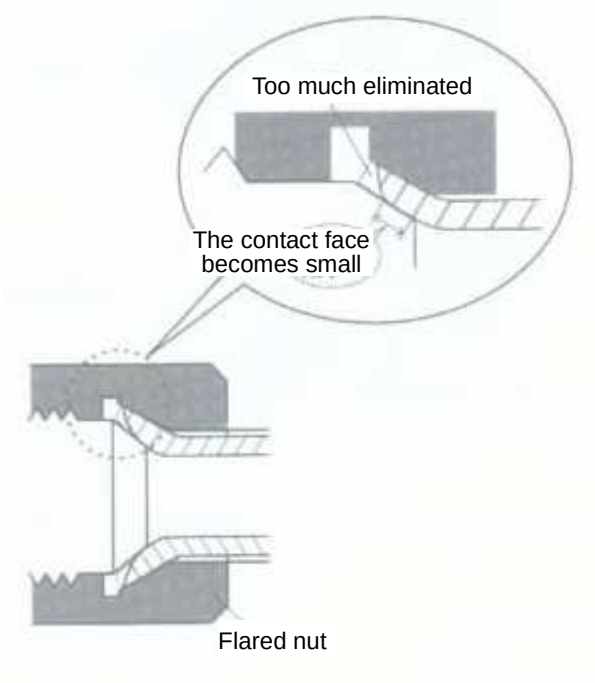
● If the pipe end is obviously deformed, please cut and throw it off, and then refinish the pipe end.

● Eliminate the copper scraps thoroughly, and use cotton yarn to wipe the pipe clean.

※ The flared joint must be kept smooth.

※ When removing the burrs with scraper, do not remove too much, especially for the fitting pipe of small diameter; otherwise the contact surface of the flared joint will be reduced. Do not cause any scores, and avoid cracking after the flared joint is formed.

※ Adverse impact if the burrs are removed too much with scraper:



5）Pipe bending

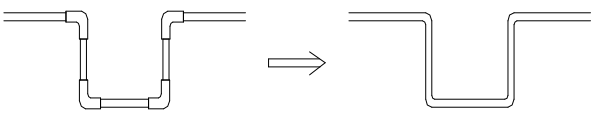
◆ Work Methods:

a) Bend by hand ……..Suitable to fine copper pipe (φ6.35mm-φ12.7mm).
b) Machining with spring pipe bender …….. Bend by inserting the spring into copper pipe or sheathing onto the copper pipe (φ6.35mm-φ22.2mm).
c) Machining with hand-operated pipe bender……Use the pipe bender of suitable dimension (φ6.35mm-φ22.2mm).
d) Machining with electric pipe bender (hydraulic)……Suitable for mass machining of fine and coarse fitting pipes (φ6.35mm-φ69.9mm).

Advantages

Decrease the weld joint, thus reduce the possibility of leakage and oxidization.

For example:



It can decrease the weld by 8 spots. Please act now to improve the quality.

※ No joint is required, which will save the material costs. Reduced waste of fitting pipe materials.

※ Reduced resistance in the fitting pipe. The bending radius higher than the pipe joint.

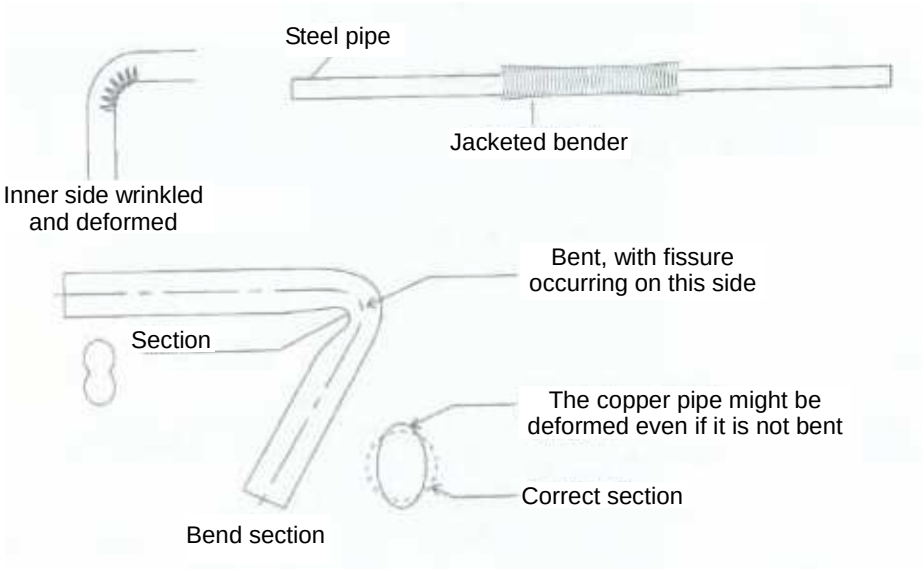
◆CAUTIONS

※ During bending, there shall be no wrinkling or deformation on the inner side of the copper pipe.

※Spring pipe bend

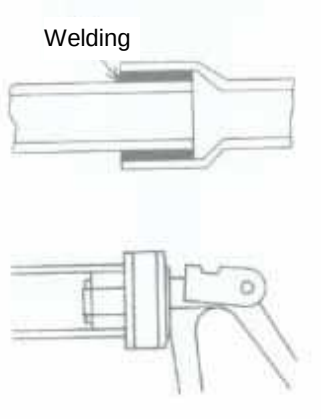
※ The bender inserted into the copper pipe must be cleaned.

※ Do not bend over 90º. (Otherwise, wrinkling may be formed on the inner side of copper pipe and in the future, the copper pipe will be broken from this position.)


Steel pipe
Jacketed bender
Inner side wrinkled and deformed
Bent, with fissure occurring on this side
Section
The copper pipe might be deformed even if it is not bent
Correct section
Bend section

6）Flaring

The flaring refers to expansion of pipe opening. The copper pipe is inserted here to replace the casing pipe. In this way, it is only needed to weld on one position where the pipe is expanded.



6.6 Installation of Refrigerant Piping

1）Precautions on piping works

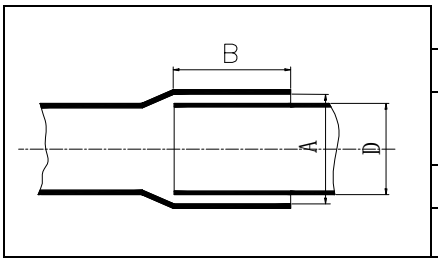
- At the site of transport, storage and construction, the two ends of copper pipes shall be sealed with plastic sealing caps. Before welding, copper pipes must be cleaned (washing the inner side of pipe with alcohol) to ensure no dust and no water in pipeline.
- Nitrogen-filled welding shall be used for the welding of copper pipes. Nitrogen pressure shall be 0.05～0.3MPa. Nitrogen flow can be sensed by hand.
- When multiple multi-connected units are installed, refrigerant piping must be marked to avoid confusion between pipes of different units.
- A two-way drier shall be mounted at the liquid pipe side at the place where an outdoor unit is connected.

2）Assemble copper pipes

The copper pipe shall be vertically inserted to the specified length. The centerline of two assemblies shall overlap. The position shall be determined for welding. To ensure correct mounting size, do not determine the position with your hands, thus to prevent the copper pipe from moving when heated.

See below for the welding size of copper pipe:

	Outer diameter of pipe D (mm)	Min. insert depth B (mm)	Clearance A-D
	ϕ6.35	6	0.05～0.21



ϕ9.52, ϕ12.7	7	
ϕ15.8	8	0.05～0.27
ϕ19.05, ϕ22.2, ϕ25.4	10	
ϕ28.6, ϕ31.8	12	0.05～0.35
≥ϕ35	14	

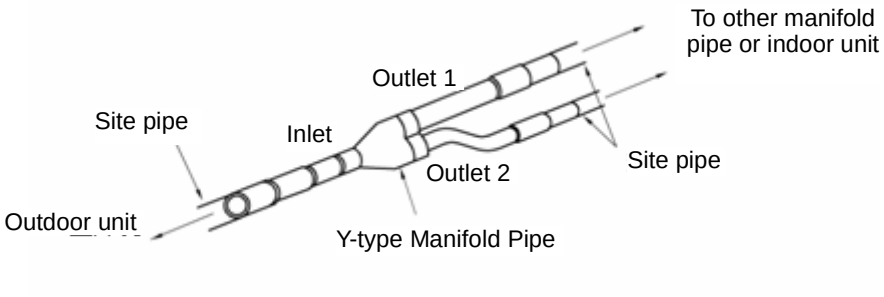
If the mounting clearance is too large, the diameter of coarse pipe may be reduced to an appropriate value to according to applicable specifications.

3）Installation of branch pipe

The branch pipe plays the function to divert the refrigerant flow. Therefore, the selection and installation of branch pipe is very important to the operation of multi-unit. Based on correct selection of branch pipe, the branch pipe must be installed according to installation specifications.

◆ Connection schematics for Y-type branch pipe

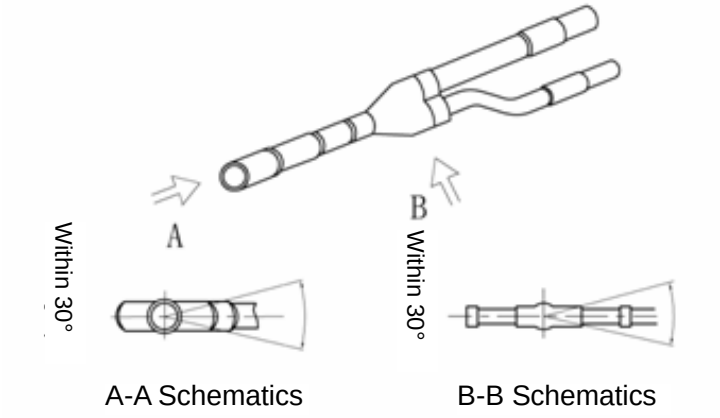
The connection of Y-type branch pipe is as shown below. The inlet is connected to outdoor unit or previous branch; the outlet is connected to indoor unit or next branch.

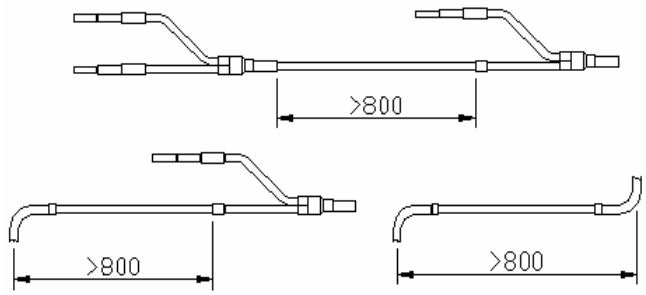


◆ Installation specifications for branch pipe

Placement of branch pipe

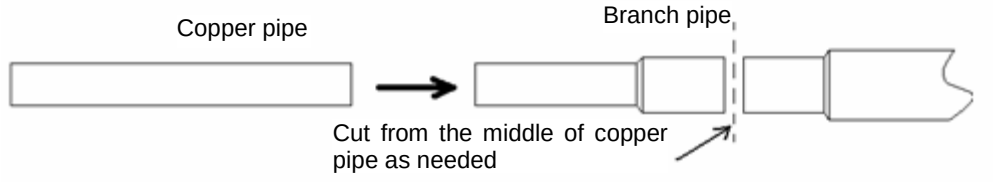
The branch pipe can only placed horizontally. Meanwhile, two branch pipes must be on the same plane. The spacing between two branch pipes must be over 800mm, the spacing between two bends must be over 800mm, and the spacing between branch pipe and bend point must also be over 800mm.



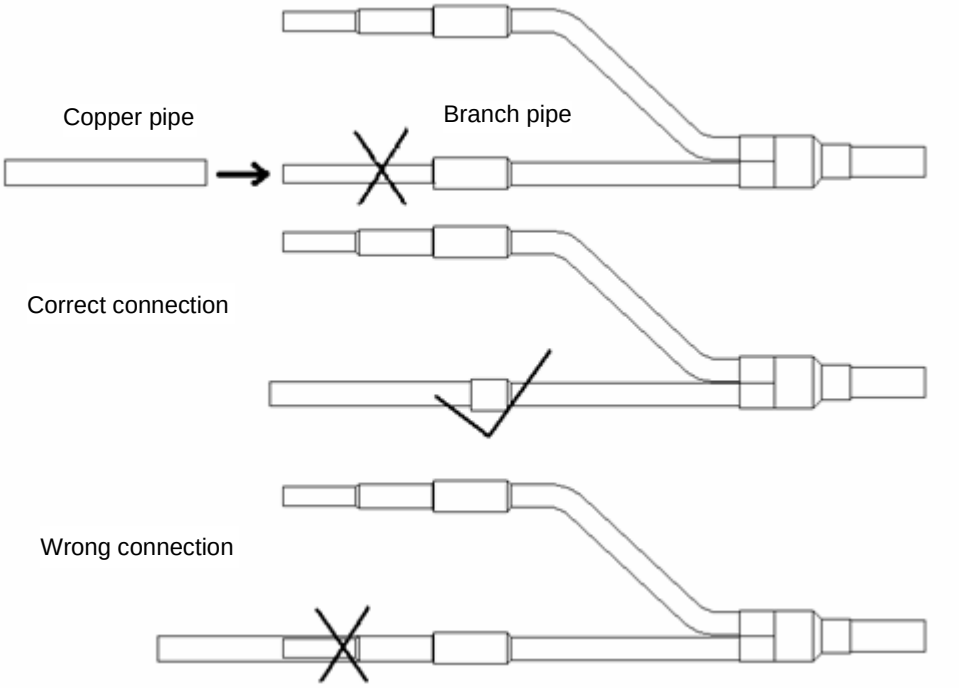


Connection of branch pipe

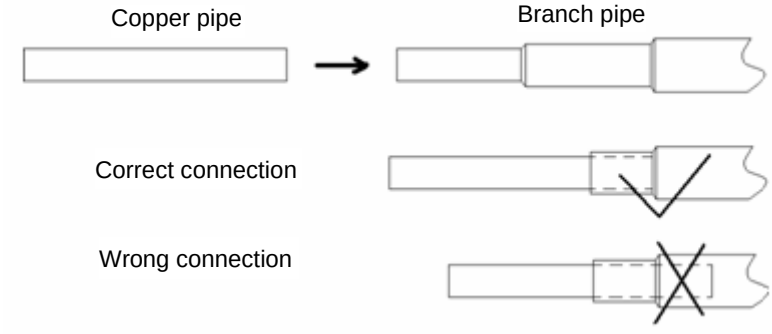
The Y-type branch pipe is installed with additional tube. The purpose is to adjust the different pipe diameters. If the pipe size selected on site is different from the size of branch connector, please use the pipe cutter to cut from the middle of different connection pipes and remove the burrs. Then, insert the copper pipe to appropriate depth. The branch pipes from Gree are all provided with positioning mark.



The connection method that copper pipe is in couple with a smaller branch pipe shall not be used.



Copper pipe shall not be inserted too much for connection with branch pipe.



6.7 Welding of Copper Pipe

1）Braze welding

Materials for braze welding

There are two kinds of braze welding, soft braze welding and hard braze welding. Hard braze welding is required in this case.

Selection of braze welding

Red copper + red copper：brazing filler metal is Bcu93P（GB 6418），and welding flux is not needed. Flame flux: capable of preventing the surface of copper pipes from oxidation, recommended for use.

Temperature for braze welding： 820-860℃ (copper pipe becomes light red)

2）Safety acknowledgement before operation

a. **Safety acknowledgement before operation**

b. Acknowledgement on work suits（helmets, clothes, safety bags and safety shoes）

c. Description of work location and environment

d. Job division shall be made. Job content, method and order shall be indicated. Risk prediction activities shall be performed.

e. “Construction Schedule” shall be worked out.

f. Head of each group shall be assigned.

g. Risks of occurrence of an accident such as electric shock or fire shall be indicated.

h. Instructions on how to use electric machinery properly shall be available.

i. Locations marked with “Staff Only” shall be indicated.

j. An application is necessary for use of open flame and shall be reviewed by on-site safety officer for approval.

k.Instructions given by fire authorities shall be accepted in accordance with local laws and regulations.

l. Tools shall be sorted and counted. Upon knocking off for the day, tools shall be sorted and counted. If necessary, the piping system shall be charged with coolant to avoid exhaustion.

a. Construction personnel must have relevant operation qualification.

Flame operation must be undertaken by qualified persons in accordance with local laws and regulations.

b. Wear coveralls (cotton for the best), safety shoes, safety helmet, leather gloves, protective goggles and anti-dust mask.

Welding torch with back fire arrestor shall be used to ensure safety.

c. Take care not to be burned by flame and heating parts.

d. Gas cylinder shall be handled carefully to prevent leakage.

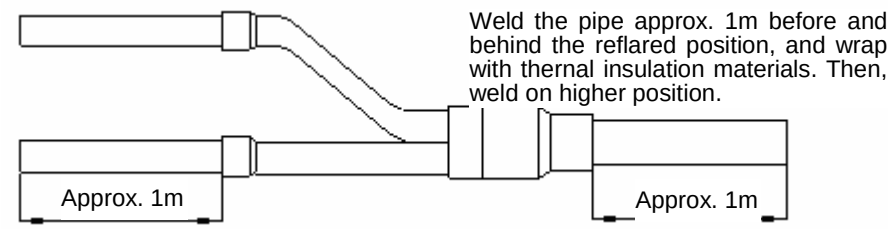
e. Combustible substances in the surrounding areas shall be moved away. If movement is impossible, fire proofing treatment shall be taken properly, such as being covered by flame-proof enclosure.

f. Good ventilation is necessary to avoid breathe in of harmful gas.

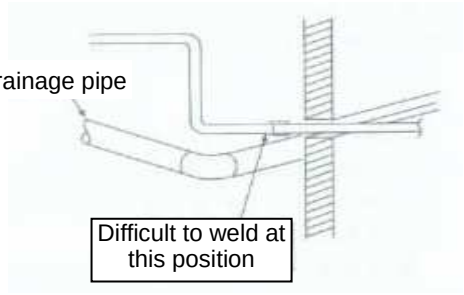
g. Appropriate measures shall be taken if there is a safety problem.

h. Operation on connectors of branch pipes as well as on the surrounding of pipe ends shall be performed on the ground as possible, because heating is difficult to control at a high place and welded part of a branch pipe is prone to be melted to cause leakage.

For example:

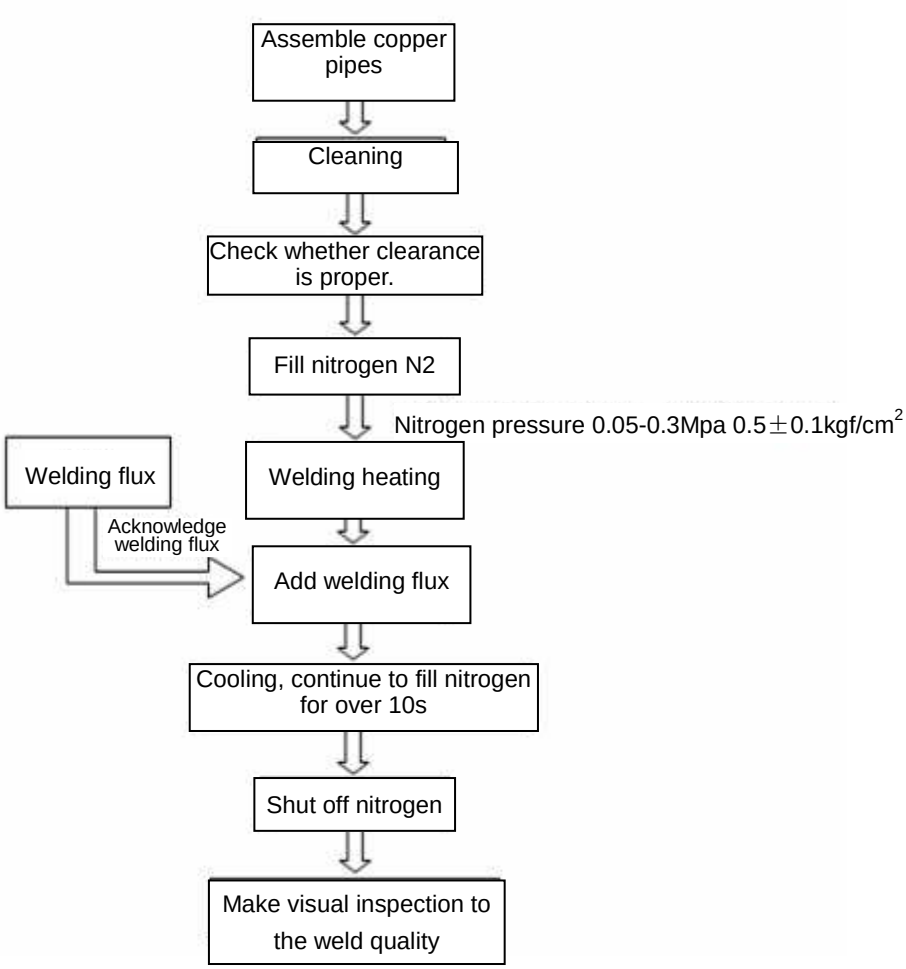

Weld the pipe approx. 1m before and behind the reflared position, and wrap with thernal insulation materials. Then, weld on higher position.
Approx. 1m
Approx. 1m

i. To avoid the position difficult to weld, you may add a prefabricated assembly below.



4）Operation order

Basic procedures for welding:



a. Cleaning of portions for braze welding

Polishing……Removing metal materials at connection portion. (Removing oxidation film using non-woven fabric, abrasive cloth or abrasive paper)

Ungrease……If any oil stain is existent, acetone or spirit solvent shall be used for ungrease treatment.

At the same time, compressed air at 0.8MPa (gauge pressure) shall be used for cleaning. The cleaning shall be repeated not less than 3 times, until there is no dirt discharged.

b. Check whether clearance between pipe and connector is proper.

Put the connector into the pipe and face downward. If the connector does not fall down depending on friction force, the clearance is considered proper.

c. Nitrogen-filled protection

- Since vigorous oxidation would occur on the surface of copper pipe at braze welding temperature,

to effectively restrain the generation of oxide coating in copper pipe, nitrogen-filled protection for copper pipe is necessary.

● After copper pipes are assembled, nitrogen shall be filled in copper pipe connectors.

● **Nitrogen charging method：**

Pressure is 0.05~0.3MPa. Nitrogen flow of 4~6L/min (gas flow can be sensed by hand) shall be guaranteed to charge in work pieces.

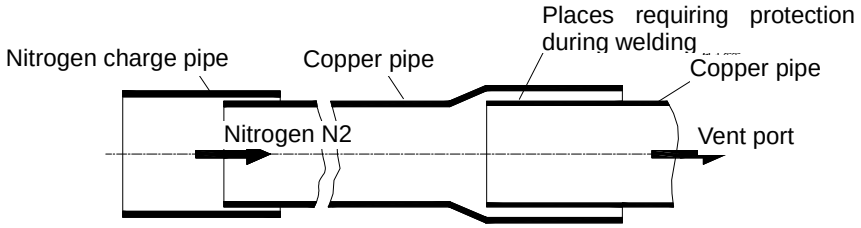
After assembling, nitrogen begins to charge until welding is finished and will continue over 10s during cooling after welding.

※ Main points of nitrogen charge（See the drawing below）

◆ When nitrogen is charged, the press switch on the quick connector and inflator shall be closed to let nitrogen totally filled in the pipe.

◆ Make sure nitrogen reaches all welding connectors in order to effectively discharge air.

◆ A vent port must be available when nitrogen charge is continuously performed, or otherwise gas would escape from gap around connector, making welding stuffing difficult and prone to pores.



d. Welding heating

Notes:

● Braze welding is flame hard braze welding. Relevant safety operating regulations must be abided by.

● Confirm that nitrogen is flowing through before copper pipe is heated.

● Neutral flame or slightly reducing flame shall be used for red copper braze welding. Outer flame is normally used. Copper pipe connectors shall be heated uniformly. Take care to distribute heat in terms of dimension of pipe material. Generally, insert pipe shall be preheated at first for close matching and then swayed along length of connector to make it heated uniformly until braze welding temperature is approached; then copper pipe is heated circularly to reach braze welding temperature (copper pipe becomes light red) and at the same time brazing filler metal is added circularly to fill in the clearance around the connector uniformly; and afterwards, the welding torch is slowly moved away from the pipe and a small amount of brazing filler metal continues to be filled in until smooth fillet is formed.

● During heating, welding rod shall not be burned directly by flame. Heating time shall not be very long.

● During welding, flame shall be controlled well on its direction and kept away from rubber casing, sponge and cables.

e. Post-welding treatment（cooling）

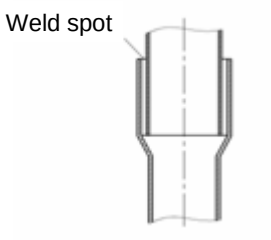
● After welding, in the condition of nitrogen protection available, the connector shall be heated until the copper pipe changes color (200-300℃), i.e. annealing treatment.

● Before welding seam becomes completely solidified, welded pieces shall not be moved or shocked.

● For welded piece cooled by water, take care not to let water enter into copper pipe and try to prevent residue water flowing into the pipe when welded piece is laid aside.

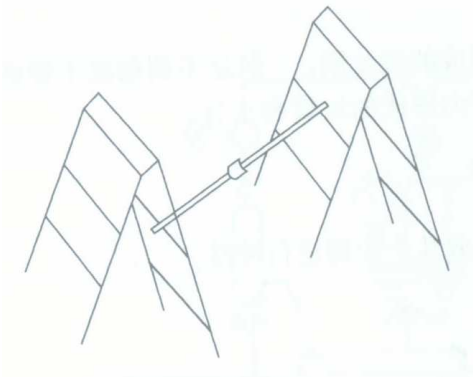
f. Quality and inspection of braze welding

Welding seam should have smooth surface. Fillet should be even and full with natural arc transition. Braze welding connector should be free from defects such as over-burning, welding blockage, crack, rough surface of welding seam and burning through. Welding seam should be free from defects such as pore, slag inclusion, underfill, rosin joint and overlap.

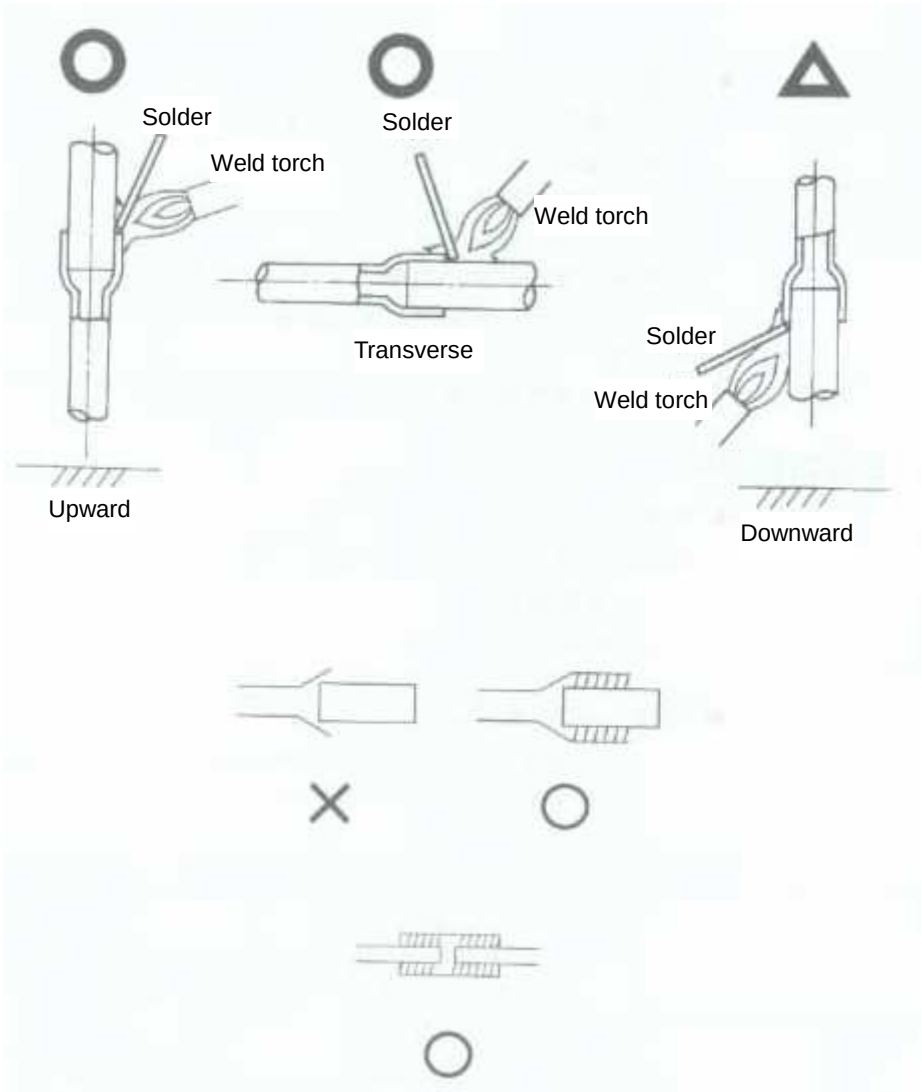


5）Others

◆ When braze welding is to be performed underneath, a simple support shall be built, such as two ladders.



◆Braze welding shall be easy to operate downward or in transverse direction. In upward operation, brazing filler metal is prone to fall so that high skills are required.



◆Cooling

To avoid getting a burn in following processes, common wet cloth (humidity content is low, meaning that there shall not be water drips when welded part is cooled; and because shrinkage factor of copper is different from that of welding material, too quick cooling that would cause cracking of braze welding shall

be avoided) can be used for cooling welded parts.

◆The following items shall be checked after welding is completed

● Is there any pore or hole on welded part?

● Is there evident “sagging of brazing filler metal”?

6.8 Cleaning of Refrigerant Piping

After a section of pipeline is welded, cleaning of piping is necessary.

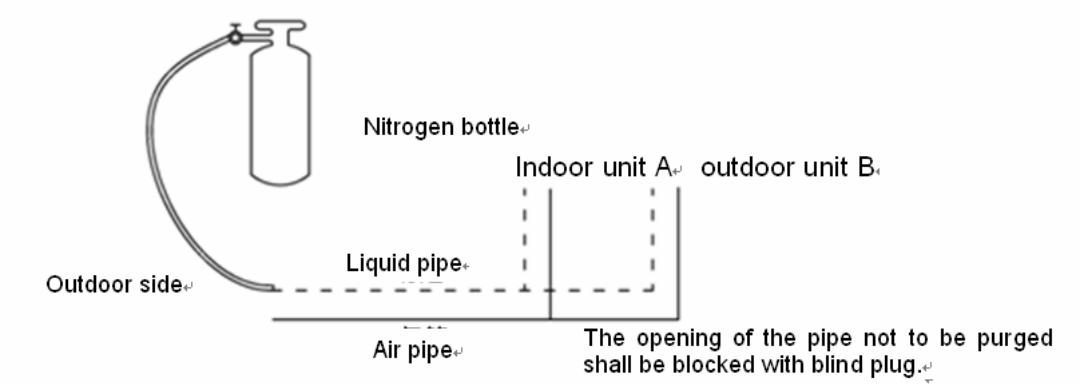
Nitrogen pressure is utilized to remove foreign matters (such as dust, water and beryllium oxide caused by welding) in the piping.

1）Main purposes of cleaning are as follows：

- ◆ To eliminate oxide caused by insufficiency of nitrogen-filled protection during pipe welding.
- ◆ To remove foreign substances and water that may enter the piping due to improper storage and transport.
- ◆ To check whether big leakage is existent at connections of the piping between indoor unit and outdoor unit

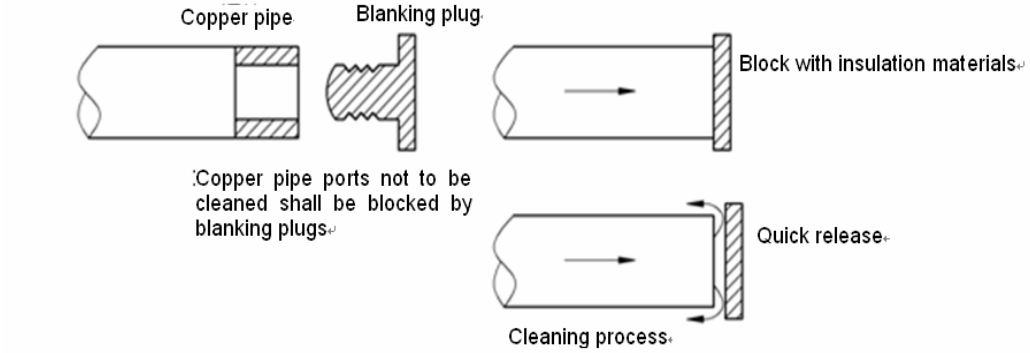
2）Cleaning steps：

a. Mount a pressure gauge on nitrogen cylinder;


Nitrogen bottle
Indoor unit A
outdoor unit B
Liquid pipe
Outdoor side
Air pipe
The opening of the pipe not to be purged shall be blocked with blind plug.

b. High pressure end of the pressure gauge is connected to the refrigerant filling nozzle of the small pipe (liquid pipe)

c. All copper pipe ports outside the A side of indoor unit shall be blocked by blanking plugs.


Copper pipe
Blanking plug
Block with insulation materials
Copper pipe ports not to be cleaned shall be blocked by blanking plugs
Quick release
Cleaning process

d. The valve on nitrogen cylinder shall be opened to maintain pressure at 28Kgf/ cm^2

e. Check whether nitrogen flows through the liquid pipe of indoor unit A

f. Cleaning

The mouth of the pipe shall be blocked with insulation material held by hand until pressure rises to a level difficult to be withstood, and at the moment the insulation material shall be released quickly. And then the mouth shall be blocked again. Repeat such procedures several times. Afterwards, use a wood board posted with white paper to check it. If there is not evident dirt on the white paper, the pipe will be considered clean.

g. Shut off the main valve of nitrogen

h. Repeat the above procedures on indoor unit B

i. After cleaning of liquid pipe, gas pipe shall be cleaned in the same way.

6.9 Pressure Maintaining and Leak Hunting

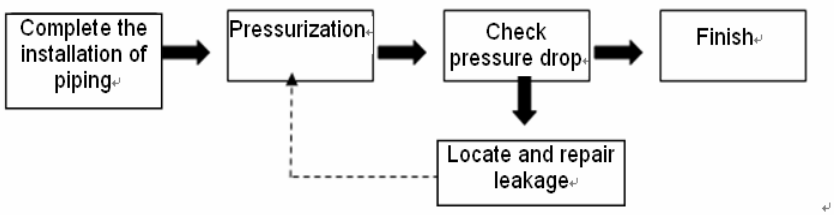
1）Pressure maintaining of refrigerant piping

After refrigerant piping of a system is welded

- ◆ A refrigerant filling nozzle shall be welded respectively on the big pipe and on the small pipe on the outdoor unit side.
- ◆ Pipes connected to the end of indoor unit and outdoor unit shall be clamped to be flat and welded to be sealed.

Steps of pressure maintaining and leak hunting of refrigerant piping are as follows:

Operating Steps:



◆ Pressurization

Use nitrogen to add pressure from Freon nozzle of the gas and liquid pipe on outdoor unit side:

Step 1: Increase the pressure to 0.3MPa and wait for 3 minutes or longer

Step 2: Increase the pressure to 1.5MPa and wait for 3 minutes or longer

The step 1 and 2 are focused on checking the significant leakage point. If any, reweld immediately or repair the leakage point.

Step 3: Increase the pressure to 2.5MPa and keep it for approx. 24 hours to check the small leakage.

Though the pressure is increased to 2.5MPa, it cannot be guaranteed to find out the small leakage if the waiting time is too short. Therefore, the pressure in Step 3 must be kept for 24 hours.

Note: During pressure maintaining after nitrogen is filled, the pressure gauge shall not be dismantled, because activities of dismantling or mounting pressure gauge would affect pressure change.

◆Check pressure drop

Criteria for Inspection eligibility:

※ Except for temperature influences (pressure changes about 0.01MPa for temperature change of 1℃), if pressure drop is not more than 0.02MPa within 24h, the system will be eligible. For example, nitrogen is filled to reach 2.5MPa at 30℃; after 24 hours, when temperature becomes 25℃, the system will be eligible if pressure is over 2.43 MPa and ineligible below 2.43 MPa.

※ If ineligible, leak sources must be located. After leak sources are found, re-welding or repair welding is necessary. Then, the above procedures shall be repeated. Nitrogen is filled, pressurized and maintained until pressure drop remains within required range.

◆Leak check

[Check 1] When pressure drop is found, leak hunting shall be performed in the ways as follows:

a. By ears…….to listen voices related to leakage

b. By hands……to sense whether leakage is existent at connecting parts

[Check 2] If no leakage is found using the above methods, nitrogen shall be discharged and refrigerant shall be filled in to reach 0.5MPa.

a. By soap and water……soap bubbles will show leakage positions if any.

b. Detector (such as halide detector) can be used for leak hunting

Using the above methods, check all possible leak sources.

If leakage still fails to be located, sectional check shall be taken for refrigerant piping that would be divided into multiple check portions for locating leak source in a certain section.

2）Pressure maintaining and leak hunting of the system（with refrigerant piping in connection with indoor unit and outdoor unit）

When refrigerant piping is to be installed, pressure maintaining and leak hunting is required for the piping. After refrigerant piping is in connection with indoor unit and outdoor unit, pressure maintaining and leak hunting is also required. The purpose of the test is to check whether any leak is existent at threaded connection of indoor unit and outdoor unit and at new welded points.

Steps:

◆Nitrogen is charged to reach 2.5MPa and remains at the pressure for 24h (nitrogen shall be filled from refrigerant filling nozzles at the big valve as well as the small valve using a pressure gauge; during pressure maintaining after nitrogen is charged, the pressure gauge shall not be dismantled.)

◆Observe whether pressure changes in 24 hours. (for eligibility criteria, see pressure maintaining and leak hunting of refrigerant piping in 5.5.2)

◆If any leakage, please check threaded connections and new welded spots of indoor unit and outdoor unit. Repair welding shall be performed immediately. Afterwards, pressure maintaining is repeated until eligibility is reached.

6.10 Heat Preservation of Refrigerant Piping

1）Connection of thermal insulation pipe

Carry out thermal insulation to the refrigerant pipe after confirming that it has no leakage.

Please perform thermal insulation to the refrigerant pipe according to the steps below

◆Check if the thermal insulation pipe has met the thickness requirements. If not, the condensing water is easy to attach on thermal insulation pipe and finally drips. The thickness requirements are shown below:

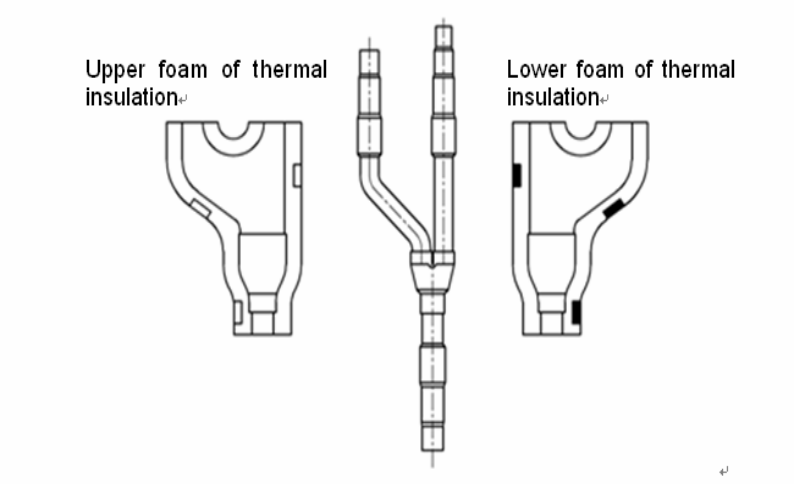
Refrigerant Pipe (mm) (Outer Dia. x Thickness)	Thickness of Thermal Insulation Materials (mm)
Φ6.35×0.5	≥10
Φ9.52×0.71	≥10
Φ12.7×1	≥15
Φ15.9×1	≥15
Φ19.05×1	≥15
Φ22.2×1.5	≥20
Φ25.4×1.5	≥20
Φ28.6×1.5	≥20
Φ34.9×1.5	≥20

◆Wrap the refrigerant pipe according to required thickness. The clearance between thermal insulation pipes shall be sealed with self-adhesive sticker.

◆Wrap the thermal insulation pipes with tapes, thus to extend their ageing time.

2）Thermal Insulation of Branch Pipe

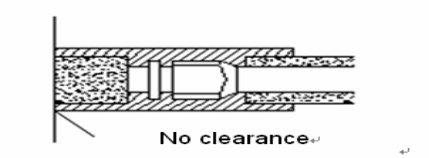
Each branch pipe is provided with foam. Wrap the branch with the included foam. The upper and lower foam shall be sealed with self-adhesive sticker. All the sections with or without foam shall be wrapped by using thermal insulation pipe. The butt connection between foam and thermal insulation pipe shall be sealed with self-adhesive sticker.



3）Cautions:

The thermal insulation materials shall be able to withstand the pipe temperature. For heat pump unit, it is required to withstand a temperature not lower than 70℃ on liquid pipe side and not lower than 120℃ on gas pipe side. For cooling-only unit, it is required to withstand a temperature not lower than 70℃ on both liquid pipe side and gas pipe side. Example: Heat resistant PVC foam (over 120℃); Foam PVC (over 100℃)

- The connector between indoor unit and outdoor unit shall be wrapped with thermal insulation materials, and shall have no clearance to the wall on which the outdoor unit is mounted, as shown below.



- When wrapping the thermal insulation tape, each circle shall suppress half of the previous circle. To avoid reducing the thermal isolation effect, do not wrap the tapes too tight.
- After completing the protection work and wrapping the pipes, use the sealing materials to block the holes in the wall.

6.11 Vacuum Pumping

1）Purposes of vacuum pumping

- Discharge air and nitrogen in the piping to obtain vacuum state.
- Vacuum is dry, capable to remove moisture in the system.

Under atmospheric pressure, the boiling point of water is 100℃. But with increased vacuum degree created by vacuum pump, the boiling point rapidly reduces. If boiling point reduces below ambient temperature, moisture in piping will be evaporated. If vacuum is 0Kgf/cm^{2}of absolute pressure (gauge pressure is -1Kgf/cm^2), moisture in the system can be evaporated totally

2）Selection of vacuum pump

Proper vacuum pumps must be selected before vacuum pumping. Insufficient capacity of selected vacuum pump would lead to overtime of vacuum pumping and fall short of the requirement for vacuum degree. A proper vacuum pump can obtain vacuum degree of 0Kgf/cm^2 (gauge pressure -1 Kgf/cm^2) after vacuum pumping

Features of a vacuum pump shall be determined by two factors as follows:

- Selection of a pump that can meet expected requirement (i.e. gauge pressure of -0.1MPa shall be obtained)
- Exhaust flow is high (over 40L/min).

The following vacuum pumps are recommended.

Model	Maximum vacuum air displacement	Use	
		Air discharge	Vacuum drying
Lubricant shaft pump	100L/min	Suitable	Suitable
Non-lubricant shaft pump	50L/min	Suitable	Suitable

Comparison table of different pressure units is as follows:

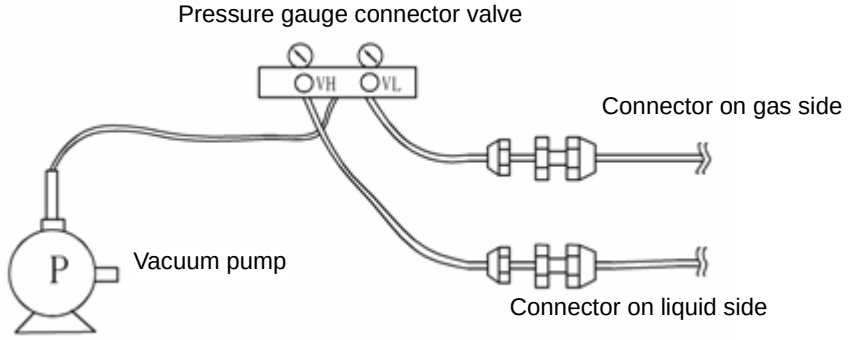
	Unit	Standard air pressure	Vacuum degree
Relative pressure	kg/cm^2	0	-1.033
Absolute pressure	kg/cm^2	1.033	0
mm Hg	mmHg	0	-755

3）Vacuum pumping

The steps are as follows:

a. Expel the nitrogen after leakage detection;

Connect the pressure gauge to Freon nozzle on outdoor liquid valve and gas valve, and connect a vacuum pump. Then, establish vacuum simultaneously from high pressure side and low pressure side.



Start the vacuum pump and turn on "L_O" and "H_I" knobs

b. Continue for 0.5~1.0 hour after the vacuum level reaches -0.1MPa (gauge pressure -1kgf/cm^2). Then, close the "VH" knob on high pressure end and "VL" knob on low pressure end to stop the vacuum pump.

c. Remove the hose connected to vacuum pump and reconnect it to the refrigerant tank. Expel the air in the hose. Open the "VL" knob on low pressure end to charge refrigerant to the system piping. When the pressure reaches 0.0kgf/ cm^2, close the "VL" knob on low pressure end.

d. Remove the hose connected to refrigerant tank and reconnect it to vacuum pump. Start the vacuum pump and open the "VH" knob on high pressure end. Pump for 30 minutes from high pressure end and then open the "VL" knob to pump from low pressure end, until the vacuum level reaches -0.1MPa (gauge pressure -1kgf/cm^2).

e. When the procedures for vacuum pumping are finished, refrigerant shall be charged. If the vacuum level reaches -0.1MPa (gauge pressure) or lower, the vacuuming process is then ended. Stop the vacuum pump and place still for 1 hour. Then, check the vacuum level for any change. In case of any change, it indicates that there is leakage. In this case, proceed to leakage detection and repair.

6.12 Refrigerant Charge

1）Calculation method for refrigerant charging

Refrigerant shall be charged according to calculated amount specified in engineering drawings.

Method for calculation of added refrigerant volume (based on liquid pipe)

Mass of refrigerant to be charged =∑ length of liquid pipe × refrigerant charge amount of every meter of liquid pipe.

Medium	Amount of refrigerant charge for every meter of liquid pipe（kg/m）						
	Φ25.4	Φ22.2	Φ19.05	Φ15.9	Φ12.7	Φ9.52	Φ6.35
R22	0.54	0.41	0.29	0.187	0.12	0.06	0.03
R410a		0.35	0.25	0.17	0.11	0.054	0.022

Note: a. Standard pipe length is 15m. If refrigerant piping (L) is shorter than or equal to 15m, no additional refrigerant is needed. If piping is longer than 15m (based on liquid pipe), more refrigerant shall be added. The above table shows how much refrigerant shall be charged for every one additional meter of piping.

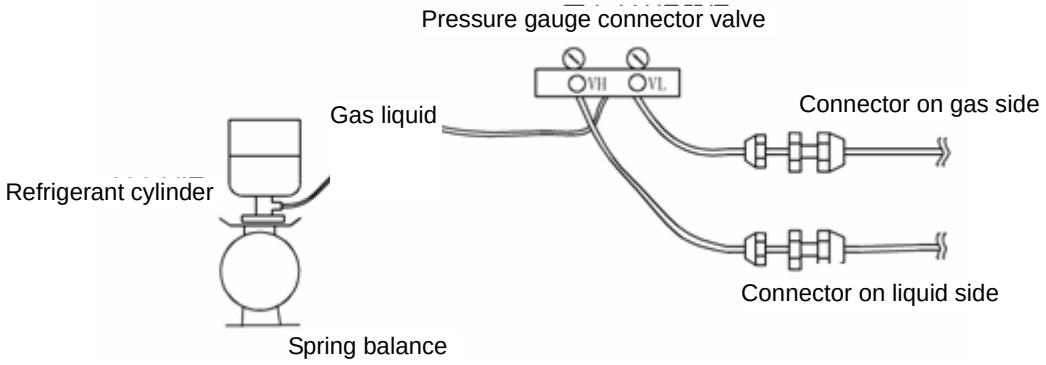
b. Electronic balance shall be used for refrigerant charge

c. Thickness of pipe wall shall be 0.5～1.0mm and pressure-bearing capability shall be 3.0MPa

d. The longer the piping, the more refrigerating capacity and heating capacity shall be weakened.

2）Steps of refrigerant charge are as follows：

a. The connecting hose of refrigerant cylinder shall be connected to the connector of the pressure gauge. The valve V_H shall be opened to discharge air in the hose. Then, the high pressure end of the pressure gauge shall be connected to the refrigerant filling nozzle on the small valve of outdoor unit.



b. Open pressure gauge valve V_H, then fill liquid state refrigerant into the liquid pipe side until required amount is reached.

If refrigerant can not be charged in system unless the unit is turned on, let the system run at full-load cooling mode. Open V_H and discharge air in the hose. The high pressure end of pressure gauge is connected to the refrigerant filling nozzle on the small valve of outdoor unit. Open V_L and charge gas state refrigerant into the gas pipe until required charging amount is reached.

c.Observe electronic balance or spring balance. When required amount is reached, the valve shall be closed very quickly and then source valve on the refrigerant valve shall be shut off.

d. The amount of charging refrigerant shall be recorded.

Refrigerant charge shall be recorded as per the following table.

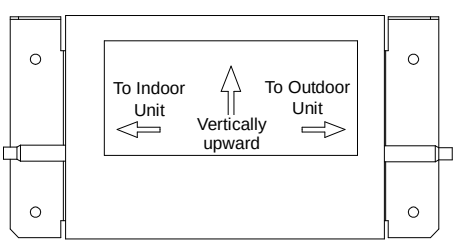
Unit Mark	Amount of charging refrigerant（Kg）
Unit 1	
Unit 2	
……	
Unit n	

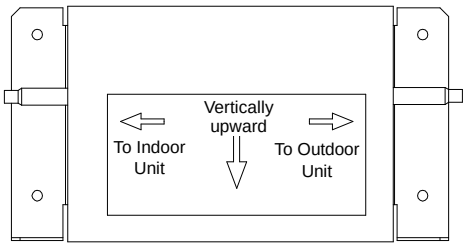
7 INSTALLATION OF ELECTRONIC EXPANSION VALVE PARTS

7.1 Direction Requirements

To ensure normal operation of the unit, please connect the electronic expansion valve sub-assembly as shown below.

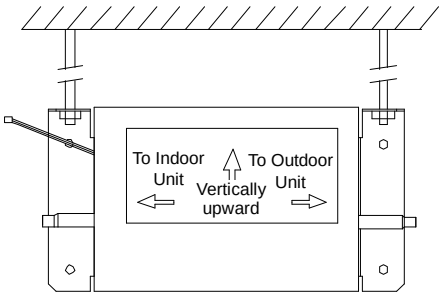
Ensure that the vertical arrow labeled on electronic expansion valve sub-assembly is pointed upward.



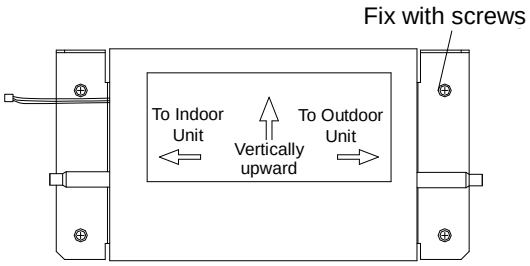


√Arrow Upward **X Arrow Downward**

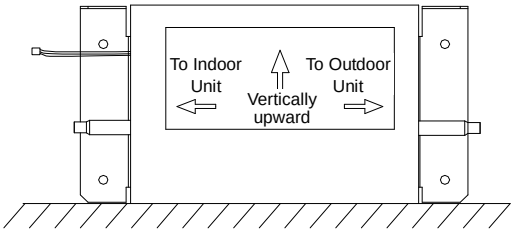
（1） Firstly, fix the electronic expansion valve sub-assembly properly. Several operating methods are available:



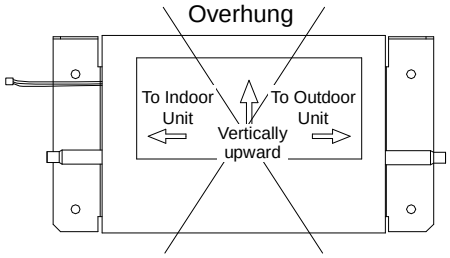
①┌ Suspend by using screw rod



②Use screws to fix onto wall

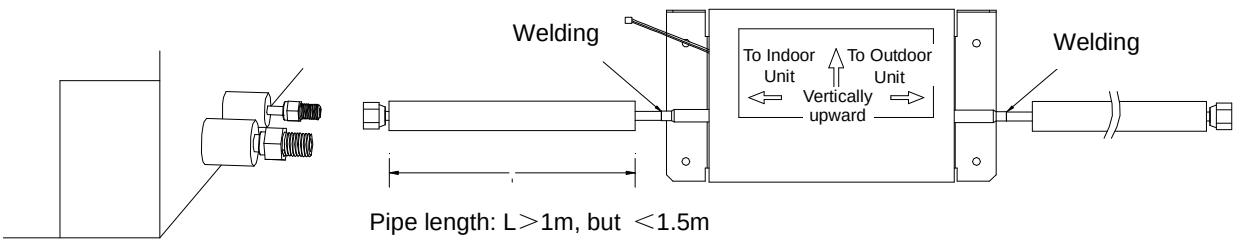


③Directly place on ceiling plane



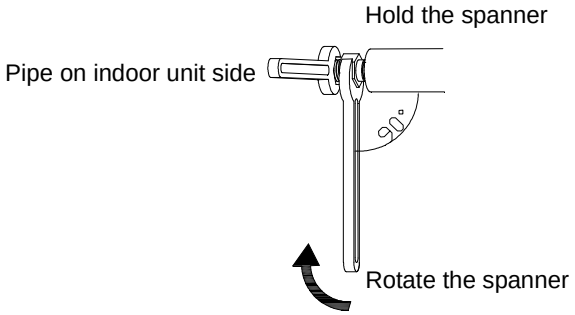
⚠ Caution: Never place overhung in air.

（2） The indoor unit shall be firstly connected to a section of pipe (connected by nut). Then, connect the pipe to the electronic expansion valve sub-assembly (by welding).



⚠ **WARNING: The length of connection pipe must be 1m≤L≤1. 5m. The electronic expansion valve sub-assembly must be connected to the indoor and outdoor unit in a direction as marked. If connected in reverse direction, severe error will be caused to the unit.**

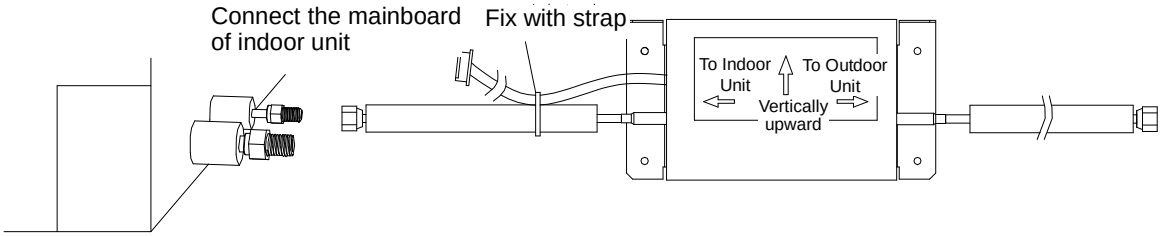
（3） Pipe connection: Tighten the nuts with your hands correctly. Then, use another spanner to hold the pipe joint on machine side and use torque wrench to tighten securely.



（4） Cable connection of electronic expansion valve sub-assembly

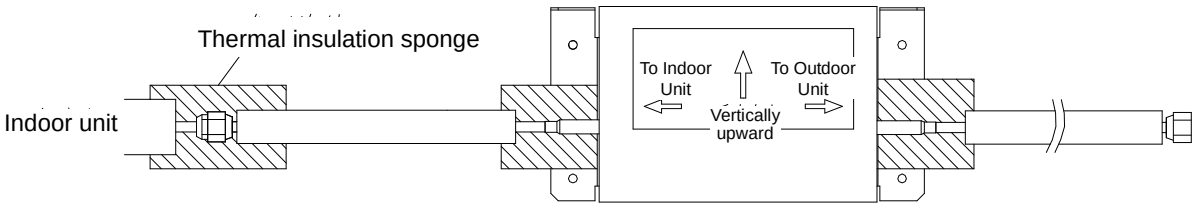
① To avoid loosening and sagging down, please use strap (small) to fix the cable of electronic expansion valve sub-assembly onto the pipe or other objects.

② When connecting the cable of electronic expansion valve sub-assembly, please take care to prevent the cable from contact with the hot or humid objects.



（5） Final treatment: The section where the pipe is connected must be wrapped for thermal insulation.

⚠WARNING!
Please ensure the pipe is fully covered by sponge and not exposed in air. Condensing water will be generated on the pipe if the thermal insulation is poor.



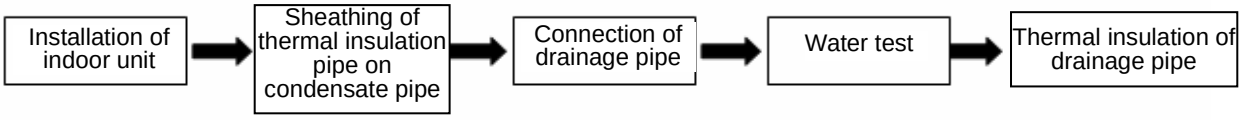
8 INSTALLATION OF CONDENSATE PIPE

8.1 Material Quality Requirements for Condensate Pipe

Generally, the condensate pipe shall be water supply U-PVC pipe, adhered by using special glue. The other materials available include: PP-R pipe, PP-C pipe and hot-dipped galvanized steel pipe. It is not allowed to use aluminum plastic composite pipe.

8.2 Key Points for Condensate Pipe Installation

1）.Work Order


Installation of indoor unit
Sheathing of thermal insulation pipe on condensate pipe
Connection of drainage pipe
Water test
Thermal insulation of drainage pipe

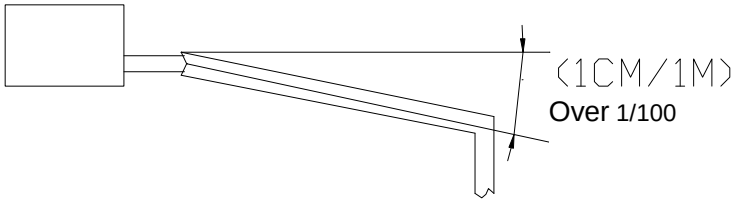
2). Determine the direction and elevation of condensate pipe before installation. To ensure the gradient smooth and straight, avoid intersecting with other pipelines. The height of the clamp fixing the pipe hanger frame shall be adjustable and fixed from the outer of thermal insulation.

3).Distance between hanger frames:

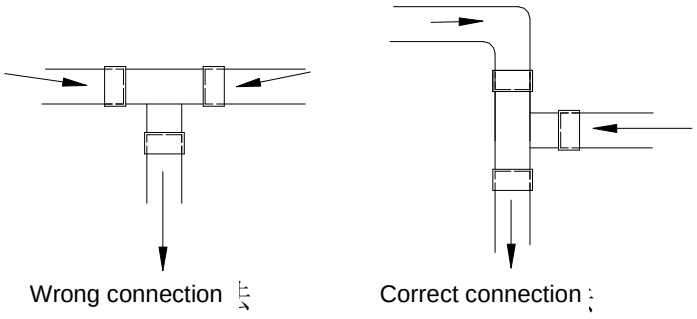
Outer diameter of water pipe (mm)	ϕ≤25	32＞ϕ≥25	ϕ≥32
Spacing between horizontal pipes (mm)	800	1000	1500
Spacing between standpipes (mm)	1500		2000

Each standpipe shall have two hanger frames at least.

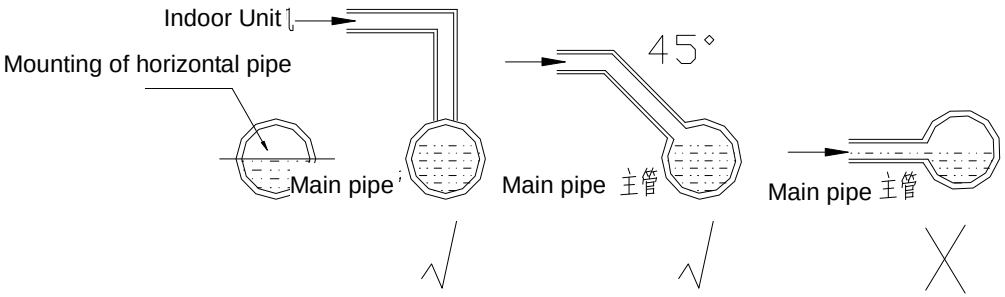
4). The gradient of condensate pipe shall be over 1% and the gradient of main pipe shall not be less than 0.3%, while there shall be no overhanging slope.



5). When connecting the 3-way section of condensate pipe, the 2-way straight section on 3-way pipe shall be on the same gradient. The two ends of 2-way section shall not have different gradient. See the schematics below:



6). Confluence toward the horizontal pipe shall be best from the upper. Back flow is easy to occur if from the lengthwise direction.



7）Do not tie the condensate pipe and refrigerant pipe together.

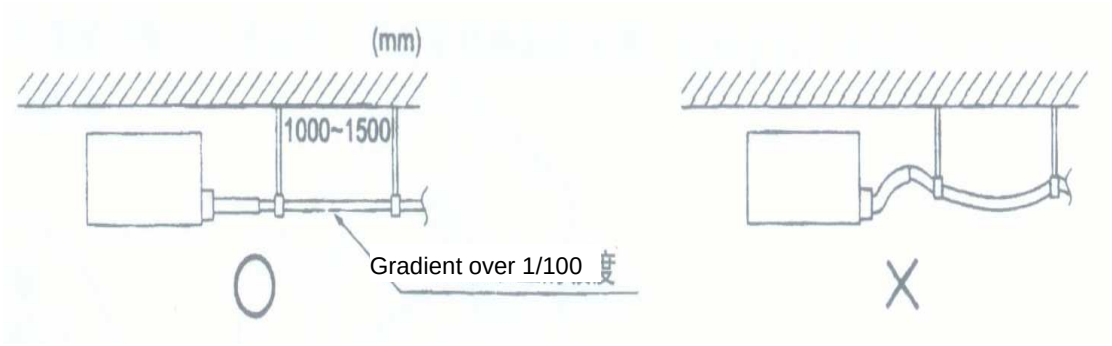
8) To ensure smooth drainage of condensate, a vent hole shall be set at the highest point of drainage pipe.

9) Carry out water flow test and full water test after the pipe connection is completed. On one hand, check if the drainage is smooth; on another hand, check the piping system for any leakage.

10) Steel sheath shall be provided to the pipe crossing the wall or slab. The pipe joint shall not be positioned within the sheath. The steel sheath shall be flush with the wall surface or slab base, but 20mm higher than the slab base. The sheath shall not affect the pipe gradient. The clearance between pipe and sheath shall be blocked by using flexible inflammable materials. The sheath shall not be used as the supporting point of the pipe.

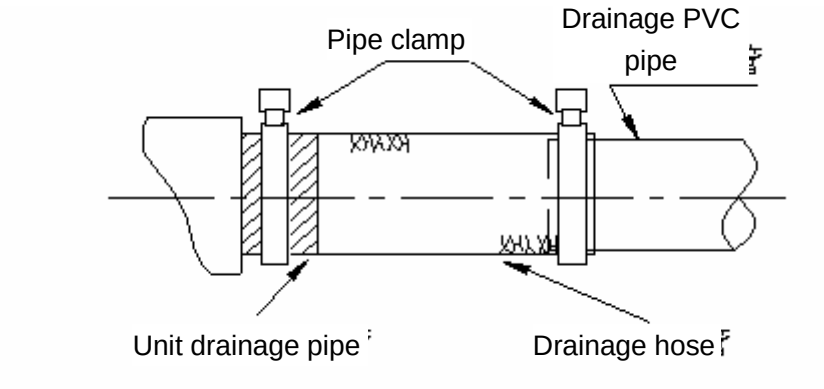
11) The joint of thermal insulation materials must be adhered by using special glue and then wrapped with plastic tape having a width not less than 5cm to avoid condensing.

12). Ensure a gradient over 1% when connecting the drainage pipe to the indoor unit.

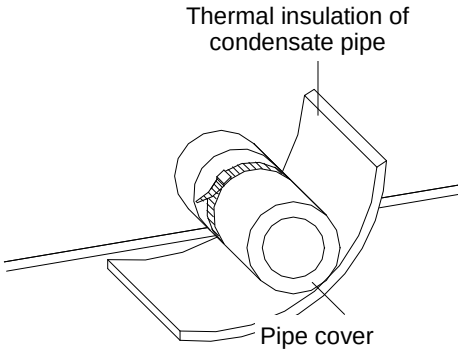


13) When connecting the drainage pipe to the indoor unit, please fix with the included pipe clamp and do not use glue water, thus to ensure easy repair.

14) Installation requirements for auxiliary drainage pipe

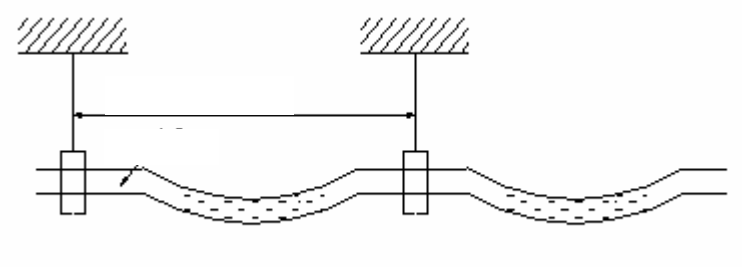


The auxiliary drainage pipe must be thermally insulated:

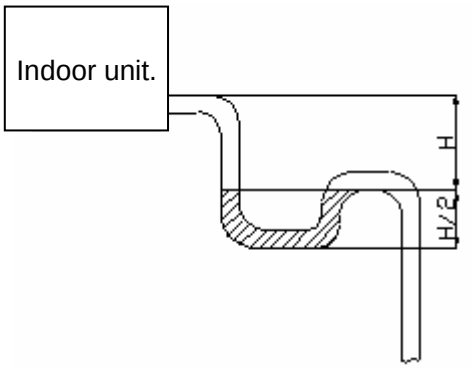


15) The long drainage pipe may be fixed by using hanger bolts, thus to ensure a gradient of 1/100 (PVC cannot be bent).

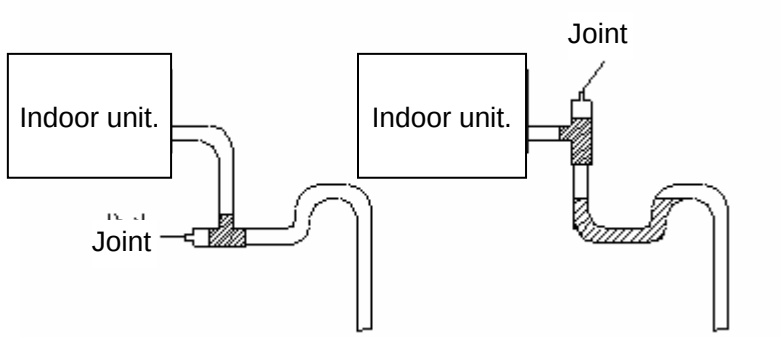
The spacing between the supports of horizontal pipe is 0.8-1.0m. Twisting will be caused and thus air bag will be formed if the spacing is too high. Once the air bag is formed, the pump can only compress the air bag no matter how forcible it pushes, but there is no flowing water, thus resulting in abnormal water level. This will cause flooding of the ceiling.



16). If the air flow of indoor unit is high, this might cause negative pressure and result in return suction of outdoor air. Therefore, U-type water trap shall be designed on the drainage side of each indoor unit.

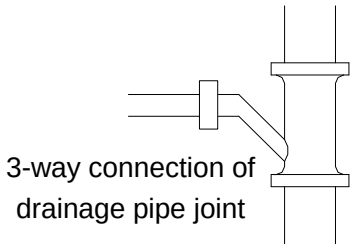


- Install water trap as shown below
- Install one water trap for each unit
- Installation of water trap shall consider easy cleaning in the future.

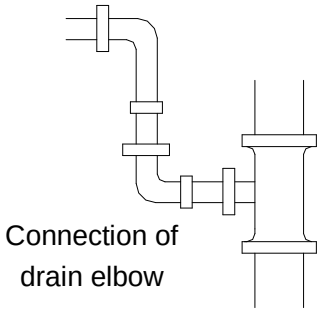


17) Connection of drainage branch pipe to the standpipe or horizontal pipe of drainage main pipe
The horizontal pipe cannot be connected to the vertical pipe at a same height. It can be connected in a manner as shown below:

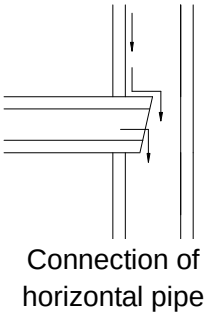
N01:3-way connection of drainage pipe joint



NO2: Connection of drain elbow



NO3: Connection of horizontal pipe



Drainage pipe is requisite for air conditioner unit. During cooling, the moisture in the air will condense on the surface of evaporator. Such condensing water must be drained out of the unit. Meanwhile, the drainage pipe has an important role to determine if the air conditioner can plays its full functions.

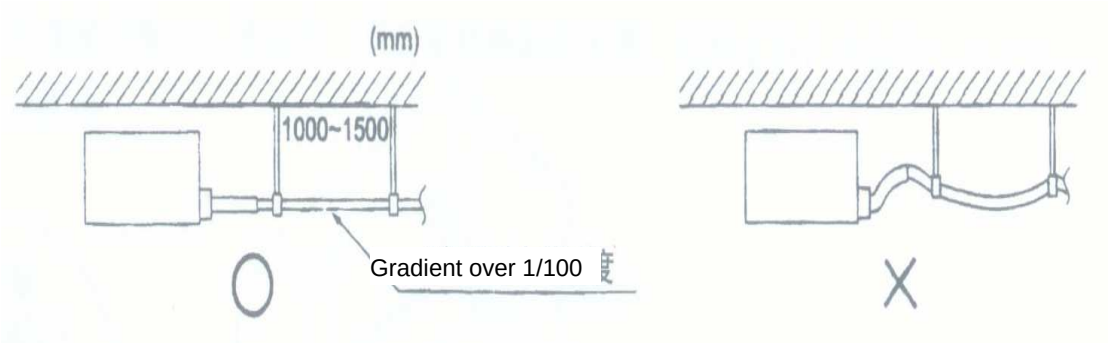
18). All the condensate pipes must be installed at a distance over 500mm from the electric box of the unit.

8.3 Installation of Drainage Pipe for Different Types of Indoor Unit

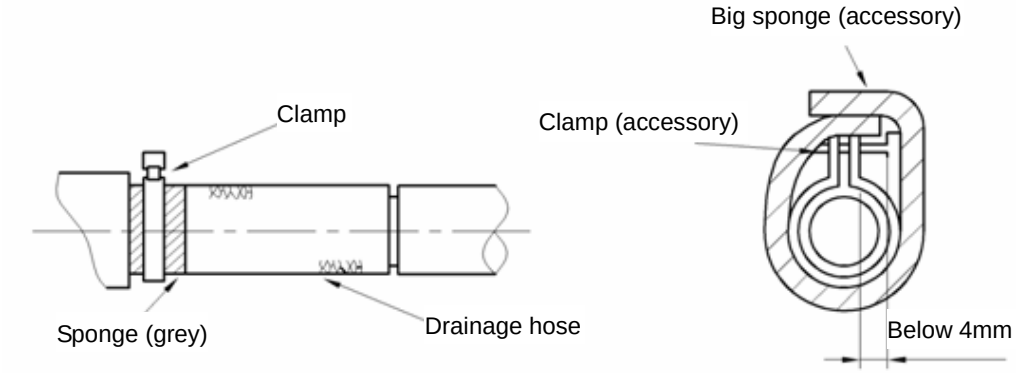
1) Duct-type Indoor Unit (Including General Static Pressure and Low Static Pressure)

a. Installation of drainage pipe

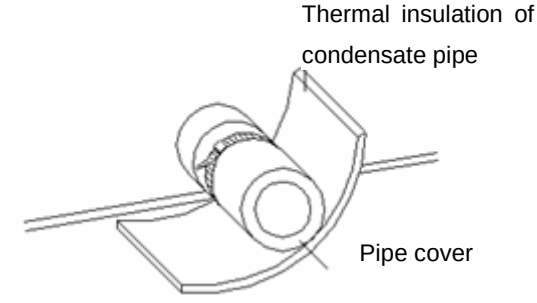
- The diameter of drainage pipe shall be equal to or higher than the diameter of connection pipe. (PVC pipe: Dimension: Outer diameter 25mm, 32mm)
- The drainage pipe shall be short and has a down gradient of 1/100 at least, thus to avoid air bag.
- To ensure that the drainage hose will not be bent and has enough gradient, a distance of 1 ~ 1.5m shall be kept between the hanger frames.



- Use drainage pipe and clamp.
  Insert the drainage hose to the root. From the middle of white tape, tighten the clamp until the tightening distance to the screw head is shorter than 4mm.
  A. For thermal isolation, use sealing tape to wrap the drainage pipe and clamp.
  B. The indoor drainage hose shall be thermally insulated.



C. To prevent foreign articles from entering the pipe, please minimize the bend of pipeline, thus to ensure cleanliness of the drainage elbow.
D. The drainage pipe must be wrapped with thermal insulation tube, thus to avoid condensing on the outer surface of drainage pipe. See below for the thickness of thermal insulation tube.



Drainage Pipe (mm)(Outer Dia)	Thickness of Thermal Insulation Materials (mm)
Φ17	≥15
Φ27	≥20
≥34.9	≥20

※ Notes:

E. The inclination of drainage hose① shall be within 75mm, so that the drainage insert will not bear excessive force.

F. To connect the drainage pipes for multiple machines, please use the method of multi-pipe collection, as shown below.

。

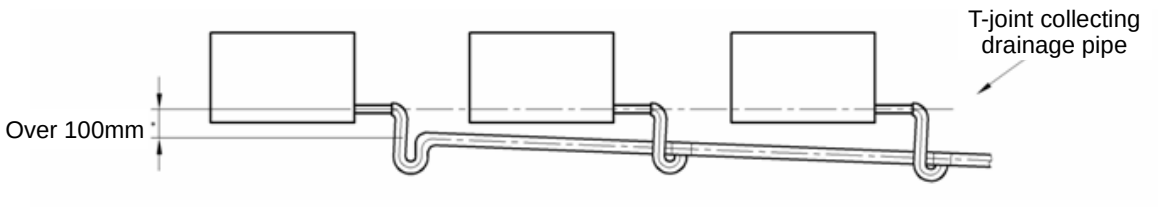


Fig. The specification of collecting drainage pipe shall be suitable to the working capacity of the unit

We may collect the drainage pipes of all the indoor units in one system (An outdoor unit and all the indoor units connected to this outdoor unit are called one system), or collect the drainage pipes of all the indoor units in several systems.

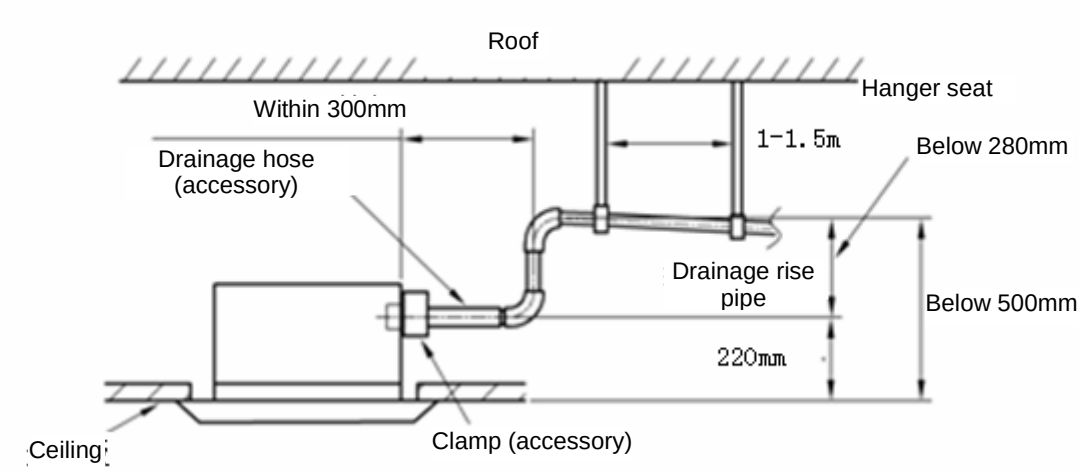
Notes: The ceiling height must be considered, and a specific gradient shall be ensured along the water flow direction.

2）Cassette Type (Four-sided Outlet)

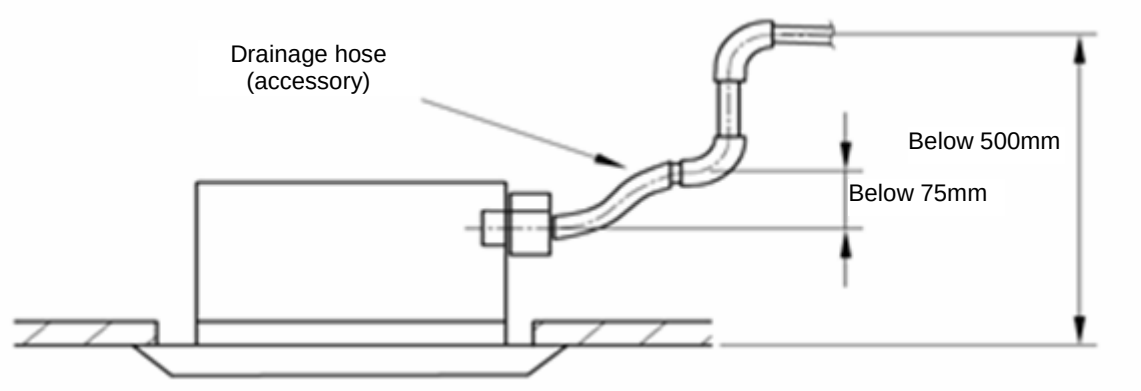
a. Installation of drainage pipe

- The drainage pipe shall be installed to ensure smooth flow of water.
- The diameter of drainage pipe shall be equal to or higher than the diameter of connection pipe (PVC pipe) (exclusive of the rise section).

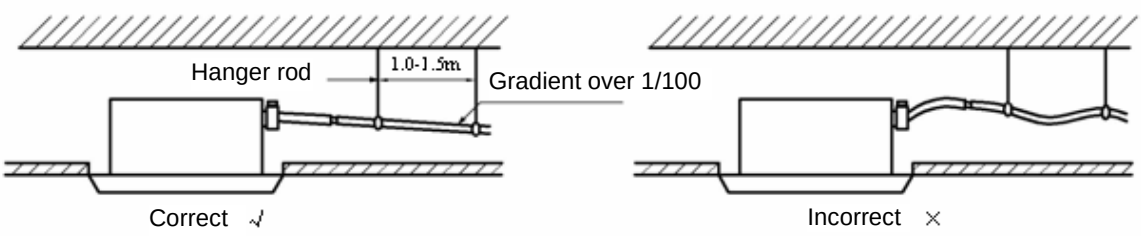
- The drainage pipe shall be short and has a down gradient of 1/100 at least, thus to avoid air bag.
- If the inclination of the drainage hose is insufficient, drainage rise pipe shall be mounted.
- The installing height of drainage rise pipe shall be less than 280mm.
- The drainage rise pipe shall be in right angle to the unit and the distance to the unit shall not exceed 300mm.



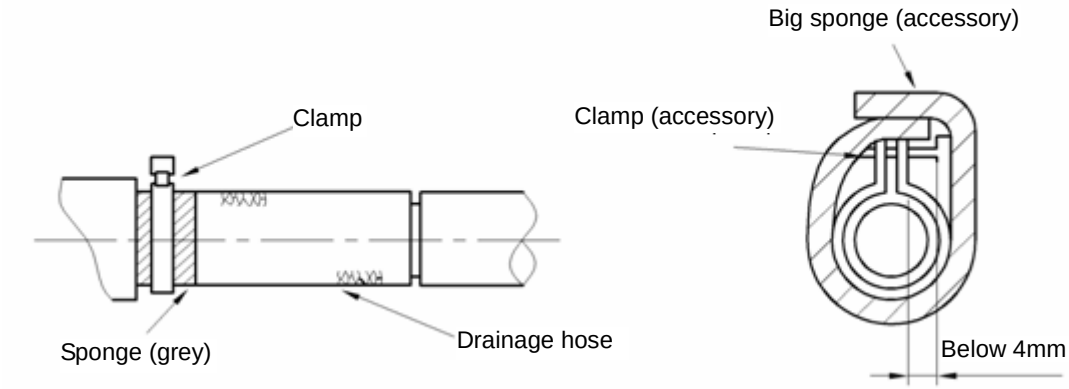
- The inclination of included drainage hose shall be within 75mm, so that the drainage insert will not bear excessive force.



- To prevent the drainage hose from dropping downward, hanger rods shall be erected every 1.0~1.5m.



- Use the included drainage hose and clamp. Insert the drainage hose to the drainage port and tighten the clamp.
- For thermal insulation, wrap the big sponge to the drainage hose clamp.
- The indoor drainage hose shall be thermally insulated.



- To connect the drainage pipes for multiple machines, please use the method of multi-pipe collection, as shown below.

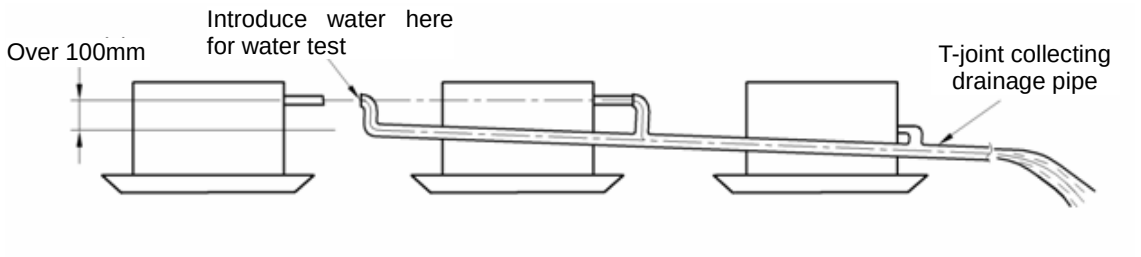


Fig. The specification of collecting drainage pipe shall be suitable to the working capacity of the unit

We may collect the drainage pipes of all the indoor units in one system (An outdoor unit and all the indoor units connected to this outdoor unit are called one system), or collect the drainage pipes of all the indoor units in several systems.

The ceiling height must be considered, and a specific gradient shall be ensured along the water flow

direction. The cassette-type indoor unit is provided with water pump, and the maximum lift of its drainage pipe is 280mm.

- During installation, please take care that:

The diameter of drainage pipe connected to the indoor unit must meet the specifications. The pipe diameter shall not be too small; otherwise the water may overflow.

The main drainage pipe depends on the number of indoor units. Generally, it is required to be equal to or higher than ϕ35mm.

The drainage pipe shall be thermally insulated. The thickness of thermal insulation pipe must meet the requirements. The clearance between thermal insulation pipes shall be sealed with adhesive sticker.

Please discharge the water to the ground drain, water closet or any other place easy to drain the water out.

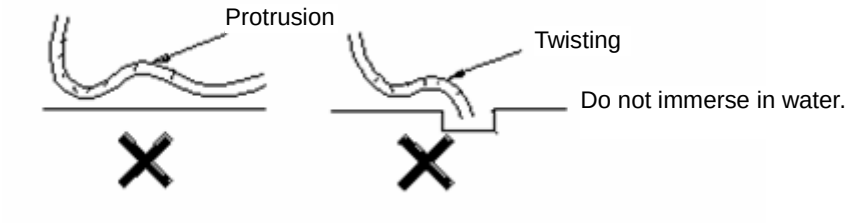
b) After installation, check if the drainage is smooth.

3) Wall-mounted Type

Assemble the drainage pipe as shown below and take measures to prevent condensing. Improper assembly of the drainage pipe may cause leakage, or even expose the furniture to moisture.

a) Assembly of drainage pipe

- To avoid air in water elbow, the drainage hose shall be kept as short as possible and inclined downward, as shown below.
- During connection, please use PVC pipe of equal size higher than this size (Nominal Dia,: 20mm; Outer Dia.: 26mm)
- The drainage pipe must be arranged in down inclination along water flow direction, thus to avoid air bubble blocking. Take care not to arrange the pipe in twisting, protrusion or waveform. Do not put the outlet of drainage pipe into water.



- The extended section of drainage hose shall be wrapped with thermal insulation sheath when passing the room.

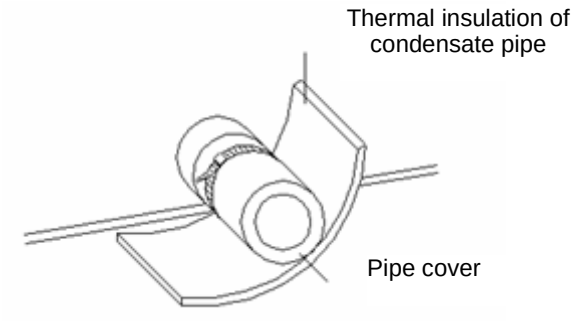
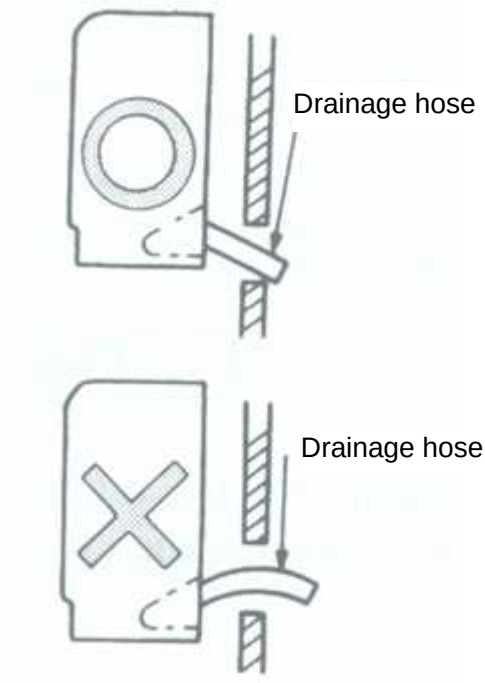


Fig.3.41

- After installation of the drainage pipe, be sure to make water test and check if the water can be drained smoothly.



b. After piping work, check if the draining flow is smooth.

8.4 Test for Condensate Pipe

The water test for condensate pipe includes closed water test and drainage test. The closed water test is focused on checking if the drainage pipe system is well sealed and if there is any leakage. The drainage test is focused on checking if the drainage pipe system can drain water smoothly and thoroughly and ensuring that there is no water deposit (except the specially designed water trap).

After connection of the drainage pipe is completed, firstly carry out closed water test. Seal the outlet of drainage pipe with adhesive tape or plug. Then, fill water into the drainage pipe system form indoor unit side. Stop filling after ensuring that all the drainage pipes are filled with water. After 24 hours, check all the joints of water pipe for any leakage. If any, repair and reinstall. If no leakage, proceed to drainage test. Remove the adhesive tape or plug from the drainage pipe. Check the water tray and drainage pipe of indoor unit if the drainage is thorough and if there is any water deposit. If any, readjust it. If not, complete the water test and proceed to the thermal insulation on all pipe joints.

8.5 Requirements of Heat Preservation

- Heat Insulation Materials

  The thermal insulation material of obturator foam shall be used. Fireproof level: B1.

  The thermal conductivity shall not be higher than 0.035w/ (m·k) when the average temperature is 0℃.
- Thickness of thermal insulation layer

  The thickness of thermal insulation layer on condensate pipe shall be over 10mm.
- The joint of thermal insulation materials must be adhered by using special glue and then wrapped with plastic tape having a width not less than 5cm to avoid condensing.
- Thermal insulation is not required for the outdoor section of condensate pipe.

9 ELECTRICAL INSTALLATION

9.1 Precautions for Electrical Installation

Itemized Description of Cautions.

The electrical installation must be done by professional electricians.

The electrical installation must be done in accordance with applicable technical codes and other rules.

WARNING! Please make sure to install earth leakage circuit breaker. Earth leakage circuit breaker must be installed to prevent electric shock or fire.

CAUTIONS!

The air conditioner must be securely earthed. Incorrect earthing may cause electric shock or fire.

- All the electric installations must be carried out by specialist technicians in accordance with the local laws, rules and these instructions.
- The indoor unit and outdoor unit shall use different power supplies. The indoor units under the same system must be powered by a unified power source. All the indoor units can only be controlled by one master power switch. Rated supply voltage and special circuit for air conditioner must be used.
- The earthing shall be secure. The earthing wire shall be connected to the special earthing device on the construction. The installation must be done by specialist technicians. Never connect the earth lead to the gas pipe, water pipe, lightening rod or telephone earth wire.
- To avoid electric shock or any accident due to mal-operation, the air switch and shock-resistant earth leakage circuit breaker that can cut off the power supply of the complete system must be installed. The air switch shall have both the magnetic tripping and thermal tripping functions to ensure protection against the short circuit and overload. Electric shock or fire might be caused if no installation of earth leakage circuit breaker. Do not switch on the power before completion of the electrical work. Make sure to cut off the power supply before repair.
- In no case should the capacitor be used to improve the power factor.
- Please use cable conduit for power cords.
- Do not lay the electronic control cables (remote control and signal line) outside the machine with other cables; otherwise the machine might become malfunctioned or failed due to electrical noise.
- The power cord must be always connected to the power cord terminal board, and fixed by using the lock connector included with the machine. Meanwhile, prevent them from contacting the fitting pipe. The diameter of power cords shall be large enough. See below for the detailed specifications. The damaged power cords and connection lines must be replaced with the designated cables. When connecting the cable, please confirm that all the electrical components inside the electric box shall have no coupling or terminal loosened. (Improper installation of electric box cover may lead to potential water leakage, which will cause the unit abnormal or short circuit).
- Earth lead must be connected before connecting the power cord. An earth lead longer than the power cord shall be provided.
- For site wiring, please refer to the circuit diagram attached on the machine body.

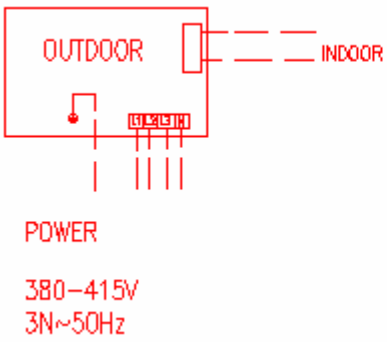
9.2 Specifications of power cord & circuit breaker

Model	Power supply (V,Ph,Hz)	Capability of circuit breaker (A)	Min. sectional area of earth lead (mm^2)	Min. sectional area of power cord (mm^2)
GMV-R120W/Na-K	220V 50Hz	16	4	4
GMVL-R120W/Na-K	220V 50Hz	16	4	4
GMV-R160W/Na-M	380V 50Hz	20	4	4
GMVL-R160W/Na-M	380V 50Hz	25	6	6
GMV-R260W2/Na-M	380V 50Hz	25	6	6
GMVL-R260W2/Na-M	380V 50Hz	25	6	6
GMV-R300W2/Na-M	380V 50Hz	32	6.0	6.0
GMVL-R300W2/Na-M	380V 50Hz	32	6.0	6.0
GMV-R450W3/Na-M	380V 50Hz	40	10.0	10.0
GMVL-R450W3/Na-M	380V 50Hz	40	10.0	10.0
GMV-R560W4/Na-M	380V 50Hz	50	16.0	16.0
GMVL-R560W4/Na-M	380V 50Hz	50	16.0	16.0
GMV-R600W4/Na-M	380V 50Hz	50	16.0	16.0
GMVL-R600W4/Na-M	380V 50Hz	80	16.0	35.0
GMV-R860W6/Na-M	380V 50Hz	80	16.0	35.0
GMVL-R860W6/Na-M	380V 50Hz	80	16.0	35.0
GMV-R900W6/Na-M	380V 50Hz	80	16.0	35.0
GMVL-R900W6/Na-M	380V 50Hz	80	16.0	35.0

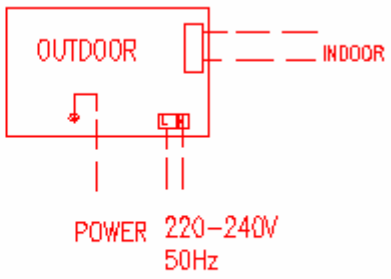
9.3 Wiring Sketch Map

9.3.1 Connection of power cord

Wiring Sketch Map for 3-Phase Outdoor Unit



Wiring Sketch Map for Single-Phase Outdoor Unit

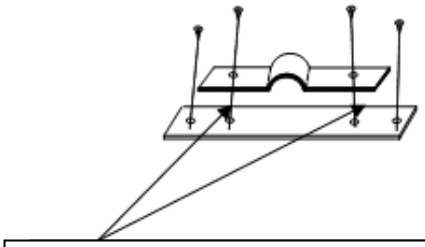


Notes: a) For the pin silk print on mainboard for connection of communication line, please refer to the lead diagram of the unit.

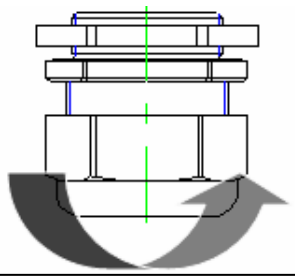
b) The outdoor signal line leading out of the electric box must be separated from the power cord and shall not be tied together. They must be kept at a distance of 10cm to the least. If they cannot be routed separately in actual application, make utmost to avoid routing in parallel.

C).The outdoor signal line must be fixed by using the cable clamp A or lock connector B in the electric box. As shown:

(A) (B)



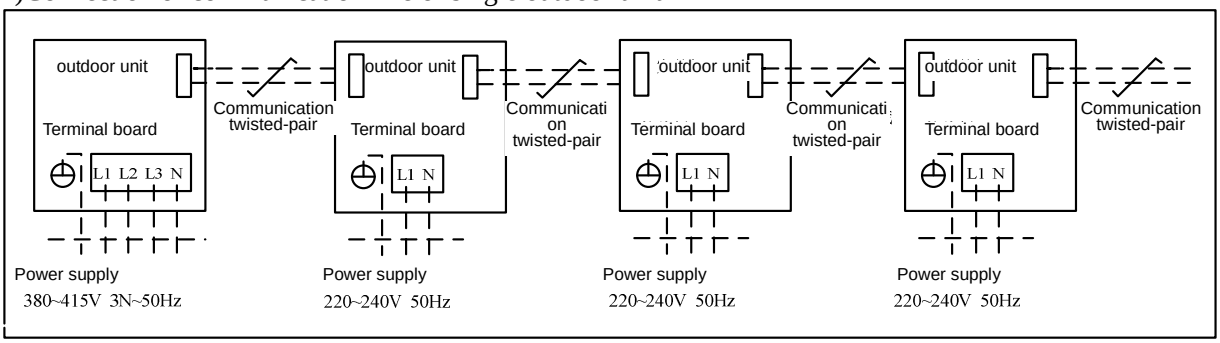
Loosen the two screws fixing the cable clamp A and insert the signal line through the cable clamp. Then, tighten the signal line with screws. If still loose, use a strap to tie at the position where the signal line passes through the cable clamp.



Open the bottom of lock connector and insert the signal line and other light-current line (temperature sensor, pressure sensor) together through the hole of lock connector. Then, rotate in reverse direction to tighten the bottom of lock connector, making the cable-cross hole shrink slowly until all the lines are locked.

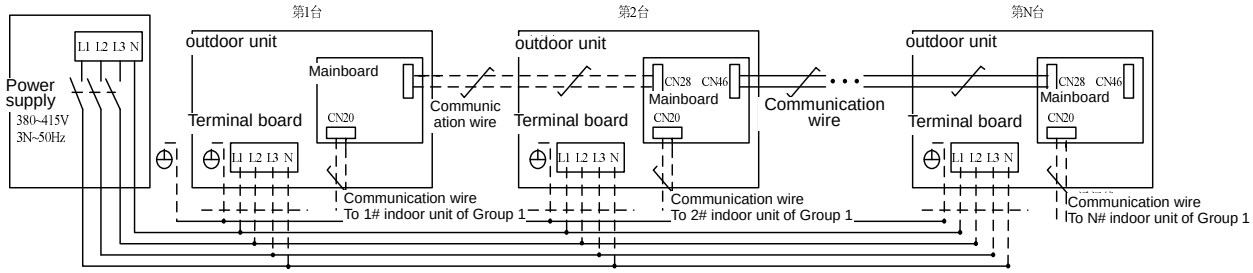
9.3.2 Connection of communication line

1)Connection of communication line of single outdoor unit



Note: The communication line to be installed on the last indoor unit is wire (resistance compatible). The indoor unit as shown is single-phase only. For the indoor unit using 3-phase electric heater, the power cable specifications and power connection shall be based on the circuit diagram attached on the unit.

2)Connection of communication line of single outdoor unit with transition board



The dotted section is the wire to be connected on user site. For the diameter and other parameters of power cable, please refer to the Installation and Operating Manual. The mainboard of outdoor unit contains module address and diversion address, to be determined and dialed on site. One outdoor unit module can connect to Max. 16 indoor units, to be determined on site. One group comprises the indoor units (Max. 16 sets) driven by one outdoor unit module.

Figure Wiring Sketch Map between Outdoor Units

One outdoor unit module can connect to Max. 16 indoor units. When the number of indoor units to be connected is ≤16, all the indoor units may be connected to the same outdoor unit module, while it is allowed to connect part of them to different outdoor unit module. When the number of indoor units in the system is ＞16 but ≤32, the indoor units may be connected to two or more outdoor unit modules; when the number of indoor units in the system is ＞32 but ≤48, the indoor units may be connected to three or more outdoor unit modules; and so on. Different outdoor unit modules shall be differentiated by using address dial-up and diversion address. For details, please refer to the Description of Dial-up Switch on Outdoor End.

During engineering installation, the communication wire shall be connected in two steps: 1) Connection between outdoor mainboard and indoor unit; and 2) Connection between modules. For details, please refer to the Wiring Sketch Map between Outdoor Units.

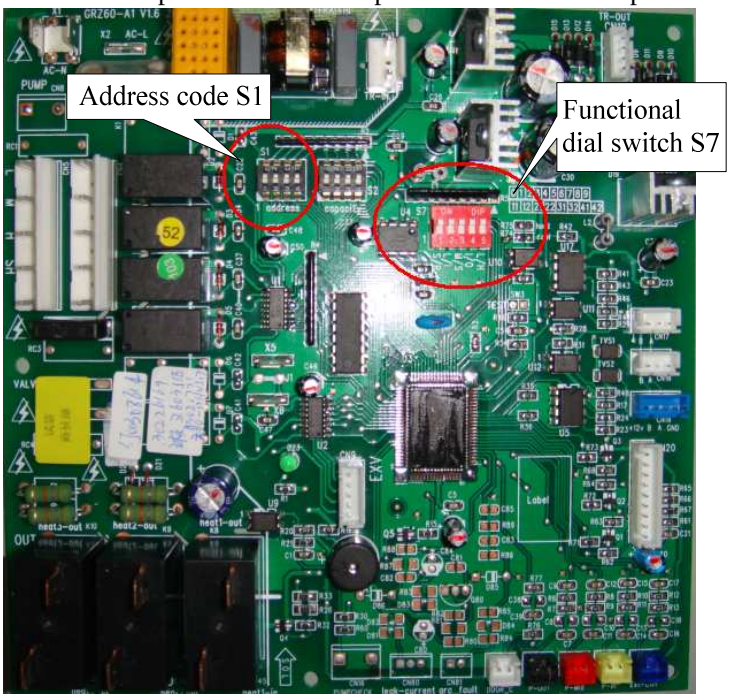
A. Connection between outdoor mainboard and indoor unit: Insert the 2-cord 3-pin wire (communication) connected to indoor unit into the 3-pin holder on outdoor mainboard (For outdoor units, the communication wire is connected in series). Then, insert another end into the 3-pin socket on the mainboard of the first indoor unit (For indoor unit, the communication wire is connected in series).

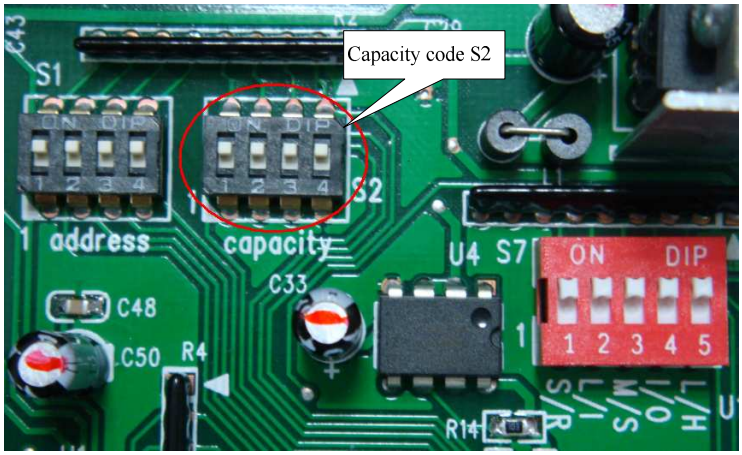
B. Communication between modules: For multi-module combination, insert one end of 2-cord 4-pin wire (communication) into the 4-pin holder on the outdoor mainboard of one module, and insert another end into the 4-pin holder on the outdoor mainboard of another module.

9.4 Dial-up of Unit

The indoor unit is provided with three dial-up, i.e. address dial-up, capacity dial-up and function dial-up. Among them, the address dial-up and function dial-up shall be set on installation site.

The duct-type unit is taken as example to illustrate the position of three dial-up:





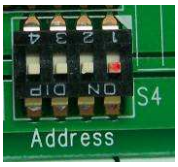
9.4.1 Dial-up of indoor unit mainboard and wire remote controller

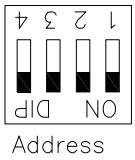
1)Address code

Address dial-up must be set for the multi indoor units; otherwise the abnormal communication will be caused to the unit. The address code has 4-bit dial-up in total. The highest address is 16 and the lowest address is 1

⚠**NOTES! To use multiple indoor units in parallel, make sure to change the setting of address code before installation and guarantee that the address code of each indoor unit must be different (The address code is located on the mainboard of indoor unit). If wired controller is used, make sure to dial the address code of wired controller to the position same as the address code on corresponding indoor unit. (The address code of wired controller is located on the back of wired controller)**

☆ Below is factory default setting:





The default setting of address dial-up code is 0000 and the address is 1 (See above for the position of dial lever).

☆ Dial-up Value

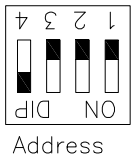
The dial-up value of address code is set in binary system. The dial-up value is “0” when the lever is dialed to “ON” end; the dial-up is “1” when the lever is dialed to numerical end on opposite side. For number 4~1 on the address code, the dial-up #4 refers to high bit and the dial-up 1# refers to low bit.

Dial-up table(dial-up switch with 4 bit)				
Bit 4	Bit 3	Bit 2	Bit 1	Address
0	0	0	0	1
0	0	0	1	2
0	0	1	0	3
0	0	1	1	4
0	1	0	0	5
0	1	0	1	6
0	1	1	0	7
0	1	1	1	8
1	0	0	0	9
1	0	0	1	10
1	0	1	0	11
1	0	1	1	12
1	1	0	0	13
1	1	0	1	14
1	1	1	0	15
1	1	1	1	16

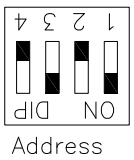
Example 1: If the dial value is “0111”, this represents that the address is “8”, the pins 1, 2 & 3 of the dial switch are dialed to the numerical end, and the pin 4 is dialed to “ON”.

Example 2: If the dial value is “1010”, this represents that the address is “11”, the pins 2 & 4 of the dial switch are dialed to the numerical end, and the pin 1 & 3 are dialed to “ON”.

See below:



Address 8, dial-up value 0111

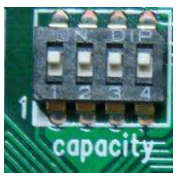


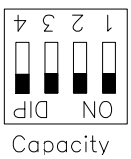
Address 11, dial-up value 1010

2)Address code about capacity

On the mainboard of indoor unit, two 4-bit DIP switches are used to distribute the address and capacity of indoor units. The 4-bit DIP switch (marked with “capacity” below) used for setting the capacity of indoor units is factory set before shipment of indoor unit, while it is covered by sealant, so that it cannot be changed by the user.

☆ Below is factory default setting:





The default Capacity dial-up is the maximum capacity of indoor unit. As shown above, the capacity is (See above for the lever position)

☆ Dial-up Value

The dial-up value of capacity code is set in binary system. The dial-up value is “0” when the lever is dialed to “ON” end; the dial-up is “1” when the lever is dialed to numerical end on opposite side. For number 4~1 on the capacity code, the dial-up #4 refers to high bit and the dial-up 1# refers to low bit.

Dial-up Table (4-bit Dial-up Switch)				
Bit 4	Bit 3	Bit 2	Bit 1	Capacity:
0	0	0	0	20
0	0	0	1	25
0	0	1	0	30
0	0	1	1	35
0	1	0	0	40
0	1	0	1	45
0	1	1	0	50
0	1	1	1	60
1	0	0	0	224
1	0	0	1	70
1	0	1	0	80
1	0	1	1	90
1	1	0	0	100
1	1	0	1	112
1	1	1	0	140
1	1	1	1	280

3)Functional dial switch S7

Functional dial switch S7			
Dial-up Switch	Functional Description:	Dial-up Setting	
		0 (ON Position)	1
1(S / R)	Setting of memory mode	Standby (S)	Restore (R)
2(L / I)	Setting of control mode	Wired control (L)	Remote control (I)
3(M / S)	Setting of master / slave indoor unit	Master indoor unit (M)	Slave indoor unit (S)
4(I / O)	Setting of ambient temperature acquisition point	Air inlet (I)	Receiver (O)
5(L / H)	Setting of high / low static pressure fan	Low static pressure (L)	High static(H)

Functional description of function dial-up:

Dial-up switch 1 (S/R): Setting of memory mode, including the standby mode and restoration mode. The standby mode refers to that the previous parameters will be kept but the unit will not run automatically after the power supply is resumed. This setting is factory defaulted (dial-up switch pulled to “ON” position). For example, if the parameters of an indoor unit set before power shutdown are High Fan and 24℃, the unit will be under standby state after the power supply is resumed and after the unit is manually started, the parameters will remain as High Fan and 24℃. The restoration mode refers to that not only the previous parameters will be kept, but also that the unit can start automatically after the power supply is resumed. But if the unit is under STOP state before power shutdown, it will be also under STOP state after the power supply is resumed.

Dial-up switch 2 (L/I): Setting of control mode, including wired control and remote control. The wired control mode refers to that the indoor unit is controlled from wired controller (hand controller). This setting is factory defaulted (dial-up switch pulled to “ON” position). When the setting is wired control mode, the function dial-up on S7 for “setting of memory mode” and “setting of master / slave indoor unit” will be disabled. These two

settings can be done from the wired controller directly. The remote control mode refers to that the indoor unit is controlled from remote controller. When the setting is remote control mode, its function dial-up must be set on S7.

Dial-up switch 3 (M/S): The setting of master / slave indoor unit refers to the master / slave setting of indoor run mode, mainly used to meet the needs of special people on priority (e.g. leader, patients, etc). The factory default setting is that all indoor units are master (dial-up switch pulled to “ON” position).

When all the indoor units are set as slave, the outdoor unit will run according to the mode of slave indoor unit that is firstly started. If the mode of slave indoor unit started later has in conflict against the mode started earlier, the system will display mode conflict error, so that the indoor unit started later cannot work. In this case, the run mode of the unit is decided by the slave indoor unit that is firstly started.

When only one indoor unit is set as master, no matter if the master indoor unit is firstly started or not, the slave indoor unit will give out mode conflict error as long as its mode is in conflict against the mode of master indoor unit (except that the master indoor unit is stopped). In this case, the unit run according to the mode of master indoor unit on priority.

When several indoor units are set as master, the mode of master indoor unit with a lower address code will be taken as the master run mode of the unit. when the master indoor unit with the lowest address code is changed from STOP state to RUN state, the mode of other master indoor units or slave indoor units shall be kept identical to its mode; otherwise the system will give out mode conflict error. Therefore, when there are several master indoor units, the address code of the unit shall be set from lower to higher according to priority level.

Dial-up switch 4 (I/O): Setting of ambient temperature acquisition point. This setting is mainly used when the temperature of air conditioner area differs largely from the air inlet temperature of the unit. Meanwhile, this setting is only valid when the receiver is connected, including the setting of temperature acquisition point at air inlet and setting of the temperature acquisition point at receiver head. The factory default setting is acquisition of air inlet temperature (dial-up switch pulled to “ON” position).

Dial-up switch 5 (L/H): Setting of high / low static pressure fan. This setting includes the setting of high static pressure fan and low static pressure fan, adjusted as needed for the project. The factory default setting is low static pressure fan (dial-up switch pulled to “ON” position).

Cautions:

1)The above settings must be done under power shutdown state.

2)The dial-up switch of function code is classified into 3-bit code, 4-bit code and 5-bit code. The 4-bit code or 5-bit code is used for duct-type unit only (including multi duct-type unit and 1-to-1 duct-type unit).

3)When the “setting of control mode” is “L”, the function dial-up for “setting of memory mode" and “setting of master / slave indoor unit” will be disabled. When the “setting of control mode” is “I”, this function dial-up setting is enabled.

4)The dial-up switch shall be put to position correctly, and shall not be put to middle position. Dialing of the switch to “ON” position indicates “0” and the dialing to opposite direction indicates “1”.

5)After dialing up, please mark the address code of the unit(√)

MAINTENANCE

MAINTENANCE
1 TROUBLE TABLES

1.1 Trouble Display of Indoor Unit

1.1.1 Trouble display of wire remote controller

Error	Error Code
button locked	CC
Indoor ambient temperature sensor error	F0
Indoor tube-inlet sensor error	F1
Indoor tube-middle sensor error	F2
Indoor tube-exit sensor error	F3
Outdoor ambient temperature sensor error	F4
Indoor tube-inlet sensor error	F5
Indoor tube-middle sensor error	F6
Outdoor tube-exit sensor error	F7
Exhaust temperature sensor 1（Fixed-frequency）error	F8
Exhaust temperature sensor 2（Digital）error	F9
Oil temperature sensor 1（Fixed-frequency）error	FA
Oil temperature sensor 2（Fixed-frequency）error	Fb
High-pressure valve error	Fc
Low-pressure valve error	Fd
High-pressure protection	E1
Prevention against low temperature	E2
Low-pressure protection	E3
Exhaust Overtemperature	E4
Overcurrent Protector	E5
Communication error	E6
Mode conflict	E7
Water-full protection (Cassette)	Eb/E9
Remote lock	EE
Auxiliary heater error	EH
Marking of master hand controller	HO
Marking of slave hand controller	SL
Marking of conflict against the effective master hand controller	CL
No master indoor unit code	No

1.1.3 Trouble display of mainboard LED of cassette type indoor unit

	Trouble LED		
Trouble name	Electrical source LED	Operation LED	Timing LED
Tube-inlet sensor error	○	●	◒
Tube-middle sensor error	○	◒	◒
Tube-exit sensor error	○	◒	○
Room sensor error	○	○	◒
Defrost	○	◒	●
Antifreeze	●	●	◒
Water-full protection	●	◒	◒
Mode conflict	●	◒	○
Communication error	◒	◒	◒
Outdoor unit failure	◒	●	●
Auxiliary heater error	◒	○	○

Legend: bright ○; dark ●; blink◒

1.1.4 Trouble display of mainboard LED of wall mounted type

➢ GMV-Rh22G/Na-K, GMV-Rh28G/Na-K, GMV-Rh36G/Na-K, GMV-Rh45G/Na-K, GMV-Rh50G/Na-K, GMV-Rh56G/Na-K

Error	Antifreeze protection	Outdoor ambient temperature sensor error	Outdoor tube-inlet sensor error	Outdoor tube-inlet sensor error	Outdoor tube-exit sensor error	Indoor ambient temperature sensor error
Error Code	E2	F4	F5	F6	F7	F0
Error	Exhaust overtemperature	Low-pressure protection	Overcurrent Protector	High-pressure protection	Exhaust temperature sensor 1 （Fixed-frequency） error	Indoor tube-inlet sensor error
Error Code	E4	E3	E5	E1	F8	F1
Error	Indoor tube-middle sensor error	Indoor tube-exit sensor error	Exhaust temperature sensor 2 （VRF） error	Compressor top casing sensor 1 （Fixed-frequency） error	Compressor top casing sensor 2 （VRF） error	Communication error
Error Code	F2	F3	F9	FA	Fb	E6
Error	High-voltage sensor error	Low-voltage sensor error	Mode conflict			
Error Code	Fc	Fd	E7			

➢ GMV-Rh71G/Na-K, GMV-Rh80G/Na-K:

	Trouble LED		
Error	Electrical source LED	Operation LED	Timing LED
Tube-inlet sensor error	○	●	◒
Tube-middle sensor error	○	◒	◒
Tube-exit sensor error	○	◒	○
Room sensor error	○	○	◒

Defrost	○	◒	●
Antifreeze	●	●	◒
Mode conflict	●	◒	○
Communication error	◒	◒	◒
Outdoor unit failure	◒	●	●
Auxiliary heater error	◒	○	○

Legend: bright ○; dark ●; blink ◒

1.1.4 Trouble display of floor ceiling type

1.1.4.1 Trouble display of mainboard LED of floor ceiling type

	Trouble LED		
Error	Electrical source LED	Error	Electrical source LED
Tube-inlet sensor error	○	●	◒
Tube-middle sensor error	○	◒	◒
Tube-exit sensor error	○	◒	○
Room sensor error	○	○	◒
Defrost	○	◒	●
Antifreeze	●	●	◒
Mode conflict	●	◒	○
Communication error	◒	◒	◒
Outdoor unit failure	◒	●	●
Auxiliary heater error	◒	○	○

Legend: bright ○; dark ●; blink ◒

1.1.4.2 Trouble display of mainboard numerical tube of floor ceiling type

Error	Error Code	Error	Error Code
High-pressure protection	E1	Indoor tube-exit sensor error	F3
Prevention against low temperature	E2	Outdoor ambient temperature sensor error	F4
Low-pressure protection	E3	Indoor tube-inlet sensor error	F5
Exhaust overtemperature	E4	Outdoor tube-middle sensor error	F6
Overcurrent Protection	E5	Outdoor tube-exit sensor error	F7
Communication error	E6	Error with exhaust temperature sensor 1 (fixed-frequency)	F8
Mode conflict	E7	Error with exhaust temperature sensor 2 (digital)	F9
Mode conflict	Eb	Error with oil temperature sensor 1 (fixed-frequency)	FA
Indoor ambient temperature sensor error	F0	Error with oil temperature sensor 2 (digital)	Fb
Indoor tube-inlet sensor error	F1	High-pressure valve error	FC
Indoor tube-middle sensor error	F2	Low-pressure valve error	Fd
Auxiliary heating protection	EH		

1.2 Trouble and State Display of Mainboard LED of Outdoor Unit

Definition:

- LED4, LED3, LED2, LED1: Fault indicator (yellow)
- LED5: Run indicator (green), bright when the unit runs normally and dark when the unit is stopped.
- LED6: Power indicator (red), bright when the power is connected and dark when the power is disconnected.

1.2.1 Trouble of elements

Error Description	Display of Error Lamp						Fault display
	LED6	LED5	LED4	LED3	LED2	LED1	
Low-pressure valve error	○	◒	○	○	◒	◒	Fd
Variable-frequency top casing temperature sensor error	○	◒	○	●	●	◒	/
Radiating fin sensor abnormal	○	◒	○	◒	○	○	E5
Driver board ambient temperature sensor error	○	◒	○	◒	●	○	/
High-pressure valve error	○	◒	○	◒	◒	◒	Fc
Fixed-frequency compressor abnormal	○	◒	●	○	◒	○	/
Error with fixed oil temperature 3# sensor	○	◒	◒	○	◒	●	/
Error with fixed exhaust temperature 3# sensor	○	◒	◒	●	○	○	/
Error with outdoor coil 2# inlet temperature sensor	○	◒	◒	●	○	●	/
Error with outdoor coil 2# middle temperature sensor error	○	◒	◒	●	○	◒	/
Error with outdoor coil 2# outlet temperature sensor	○	◒	◒	●	●	○	/
Outdoor ambient temperature sensor error	○	◒	◒	●	●	●	F4
Error with outdoor coil inlet temperature sensor	○	◒	◒	●	●	◒	F5
Error with fixed oil temperature 2# sensor	○	◒	◒	●	◒	○	/
Outdoor coil middle temperature sensor error	○	◒	◒	●	◒	●	F6
Error with outdoor coil outlet temperature sensor	○	◒	◒	●	◒	◒	F7
Error with fixed exhaust temperature 2# sensor	○	◒	◒	◒	●	○	/
Error with fixed exhaust temperature sensor	○	◒	◒	◒	●	●	F8
Error with digital exhaust temperature sensor	○	◒	◒	◒	●	◒	F9
Error with fixed oil temperature sensor	○	◒	◒	◒	◒	●	Fa
Error with digital oil temperature sensor	○	◒	◒	◒	◒	◒	Fb

Legend: bright ○; dark ●; blink ◒

1.2.2 System Errors

Error Description	Display of Error Lamp						Fault display
	LED6	LED5	LED4	LED3	LED2	LED1	
The temperature of radiating fin is too high	○	◒	○	○	○	◒	E5
Top casing overtemperature protection	○	◒	○	●	◒	◒	E4
Low-pressure protection	○	◒	●	●	◒	●	E3
Exhaust protection	○	◒	●	●	◒	◒	E4
Oil temperature higher than 80℃	○	◒	◒	○	◒	◒	/
No-refrigerant protection	○	◒	◒	◒	○	●	/
High-pressure protection	○	◒	●	●	●	◒	E1

Legend: bright ○; dark ●; blink ◒

1.2.3 Controlling trouble

Error Description	Display of Error Lamp						Fault display
	LED6	LED5	LED4	LED3	LED2	LED1	
DC input voltage is too high	○	◒	○	○	○	○	E5
The current test circuit is failed	○	◒	○	○	◒	○	E5
Drive error of outdoor fan	○	◒	○	●	○	○	/
Drive voltage protection of outdoor fan	○	◒	○	●	○	●	/
Drive current protection of outdoor fan	○	◒	○	●	○	◒	/
Module overheating protection of outdoor fan	○	◒	○	●	●	○	/
Motor overheating protection of outdoor fan	○	◒	○	●	●	●	/
AC current protection on AC input side	○	◒	○	◒	○	●	/
Compressor overcurrent	○	◒	○	◒	○	◒	E5
DC input voltage is too low	○	◒	○	◒	◒	○	E5
Failed to start	○	◒	●	○	○	○	E5
PFC abnormal	○	◒	●	○	○	●	E5
Clogged	○	◒	●	○	○	◒	E5
Drive module reset	○	◒	●	○	●	○	E5
Motor out of synchronization	○	◒	●	○	●	●	E5
Open phase, tripping	○	◒	●	○	●	◒	E5
Overcurrent or drive system abnormal	○	◒	●	◒	●	●	E5
IPM abnormal	○	◒	◒	○	○	○	E5
Overspeed	○	◒	◒	○	○	●	/
Sensor connection protection (The current sensor is connected to corresponding U or V phase)	○	◒	◒	○	○	◒	/
Temperature drift protection (Prevent the outdoor ambient temperature from changing too high, which might result in that the temperature drift of sensor is too high)	○	◒	◒	○	●	○	/
AC contactor protection (AC contactor not closed)	○	◒	◒	○	●	●	/
The temperature of radiating fin is too high	○	◒	○	○	○	◒	E5

Legend: bright ○; dark ●; blink◒

1.2.4 Communication Errors

Error Description	Display of Error Lamp						Fault display
	LED6	LED5	LED4	LED3	LED2	LED1	
The dial-up number of modular multi VRF is inconsistent to the number of units communicated.	○	◒	●	◒	○	○	/
In case that one module among several modules is failed, the other outdoor units will display this error. If it is the error with outdoor unit, it will only display its own error.	○	◒	●	◒	○	●	/
Mode conflict (error with communication between 1－32 outdoor mainboard and sub-unit)	○	◒	●	◒	●	◒	/

Communication error between outdoor board and fan speed regulation board	○	◒	●	◒	◒	○	/
Communication error	○	◒	●	◒	◒	●	E6
Fault from variable frequency drive to main control communication	○	○	●	●	●	◒	E5

Legend: bright ○; dark ●; blink◒

1.2.5 State display

Error Description	Display of Error Lamp						Fault display
	LED6	LED5	LED4	LED3	LED2	LED1	
Defrost	○	◒	●	◒	◒	◒	/
Oil return	○	◒	◒	◒	○	◒	/
Oil equilibrium	○	◒	◒	◒	◒	○	/
Forcible cooling	●	◒	●	●	●	●	/
Forcible heating	◒	●	●	●	●	●	/
Forcible stop	◒	◒	●	●	●	●	/
Vacuum mode	●	●	◒	◒	◒	◒	/
The current module is master module	○	○	●	●	●	○	/
Online testing	○	○	●	●	○	●	/
Comprehensive performance coefficient testing	○	○	●	●	○	○	/

Legend: bright ○; dark ●; blink◒

1.2.6 Number of indoor units display

Number of indoor units	Display of Error Lamp					
	LED6	LED5	LED4	LED3	LED2	LED1
1	●	●	●	●	●	○
2	●	●	●	●	○	●
3	●	●	●	●	○	○
4	●	●	●	○	●	●
5	●	●	●	○	●	○
6	●	●	●	○	○	●
:	:	:	:	:	:	:
:	:	:	:	:	:	:
62	○	○	○	○	○	●
63	○	○	○	○	○	○

Legend: bright ○; dark ●; blink◒

1.3 Trouble Display of Outdoor Unit Transition Board

Definitions:

1.LED2 is power indicator (red) (bright when the power is connected and dark when the power is disconnected).

2.LED3 is run indicator (green) (bright when the indoor unit runs normally and blink when the indoor unit is stopped).

3.In case of error, LED2 and LED3 will blink alternatively.

Error	Error Code
Error with evaporator 2# coil-inlet sensor [Note]	b5
Error with evaporator 2# coil-middle sensor [Note]	b6
Error with evaporator 2# coil-exit sensor [Note]	b7
Error with fixed-frequency compressor 2# exhaust sensor error [Note]	b8

Error with fixed-frequency compressor 3# exhaust sensor error [Note]	b9
Error with fixed-frequency compressor 2# oil sensor error [Note]	bA
Error with fixed-frequency compressor 3# oil sensor error [Note]	bb
Outdoor ambient temperature sensor error	F4
Outdoor tube-inlet sensor error	F5
Outdoor tube-middle sensor error	F6
Outdoor tube-exit sensor error	F7
Error with exhaust temperature sensor 1 (fixed-frequency)	F8
Error with exhaust temperature sensor 2 (digital)	F9
Error with oil temperature sensor 1 (fixed-frequency)	FA
Error with oil temperature sensor 2 (digital)	Fb
High-pressure valve error	Fc
Low-pressure valve error	Fd
No-refrigerant protection	FE
High-pressure protection	E1
Antifreeze	E2
Low-pressure protection	E3
Exhaust overtemperature (overtemperature protection against oil temperature 80℃)	E4
Overcurrent Protection	E5
Communication error	E6
Mode conflict	E7
Oil solenoid valve protection	EA

Note: The "modular system of 3 or 4 compressors, e.g. modular type 600" or the "non-modular outdoor unit system of 3 or 4 compressors, e.g. GMV-R620W4/A, GMV-R420W3/A……" contains two evaporators. In case that the second evaporator is failed, the adaptor will display error code b5~bb.

1.4 Trouble Display of Driver Board LED

Error Description	LED1	LED2	LED3	Continuous quick blinking counts of LED1 (red): Note 4	Remarks
	Red	Yellow	Green		
Normal	◒	●	●	Blink 1 times every 250ms	No abnormality
Module protection	◒	●	◒	Blink 2 times every 250ms	Module overcurrent, undervoltage or in-built overheating, FO pin output
High-pressure protection	◒	◒	●	Blink 4 times every 250ms	Supply voltage too low or too high
Current protection	◒	◒	◒	Blink 3 times every 250ms	Working current too high
Frequency fluctuation	●	●	◒		Error between working frequency and target frequency too high
Emergency stop	●	◒	●		Emergency braking subject to the command of upper unit
Communication error	●	◒	◒	Blink 5 times every 250ms	Failed to communicate with upper unit
Loss-of-synchronization protection	◒	○	○		The rotor positioning loses function and synchronization
Over-frequency protection	◒	○	◒		Working frequency exceeding upper limit
Sensor error	◒	◒	○		Zero-point deviation of sensor too high
Sensor connection protection	○	○	◒		The current sensor is connected to corresponding U or V phase
Radiating fin temperature protection (module overheat protection)	○	◒	○	Blink 6 times every 250ms	Protection when the temperature of radiating fin is too high
Temperature drift protection	○	◒	◒		Prevent the outdoor ambient temperature from changing too high, which might result in that the temperature drift of sensor is too high
AC contactor protection	●	○	◒		AC contactor not closed
Radiating fin temperature sensor	●	◒	○		Not connected or short circuited
Motor overheat protection	◒	○	●		

Legend: bright ○; dark ●; blink◒

Remarks:
1. The silk print is unified as: LED1 – Red; LED2 – Yellow and LED3 – Green.
2. The red LED1 is the indicator showing that the variable-frequency board works normally (blink during normal operation).
3. The indicator state is classified into BRIGHT, BLINK and DARK, which are combined to indicate the error. BLINK / DARK and easily memorable combination will be used firstly.
4. Drive board error indicator for DC variable-frequency fan: (Applicable to mainboard WZS901; Code 30229004) This mainboard has one error indicator LED1 (red) only. The error is judged from the counts of continuous quick blinking. During normal operation, the indicator blinks every 1s.

Note: The code E5 represents different errors. Therefore, then the wired controller of indoor unit or the lamp displays E5 protection, please do not immediately cut off the power of complete unit, but checking the records of mainboard, adaptor board and drive board on outdoor side and observing the detailed display of the error lamp to identify the specific error protection.

2 FLOW CHART OF TROUBLESHOOTING

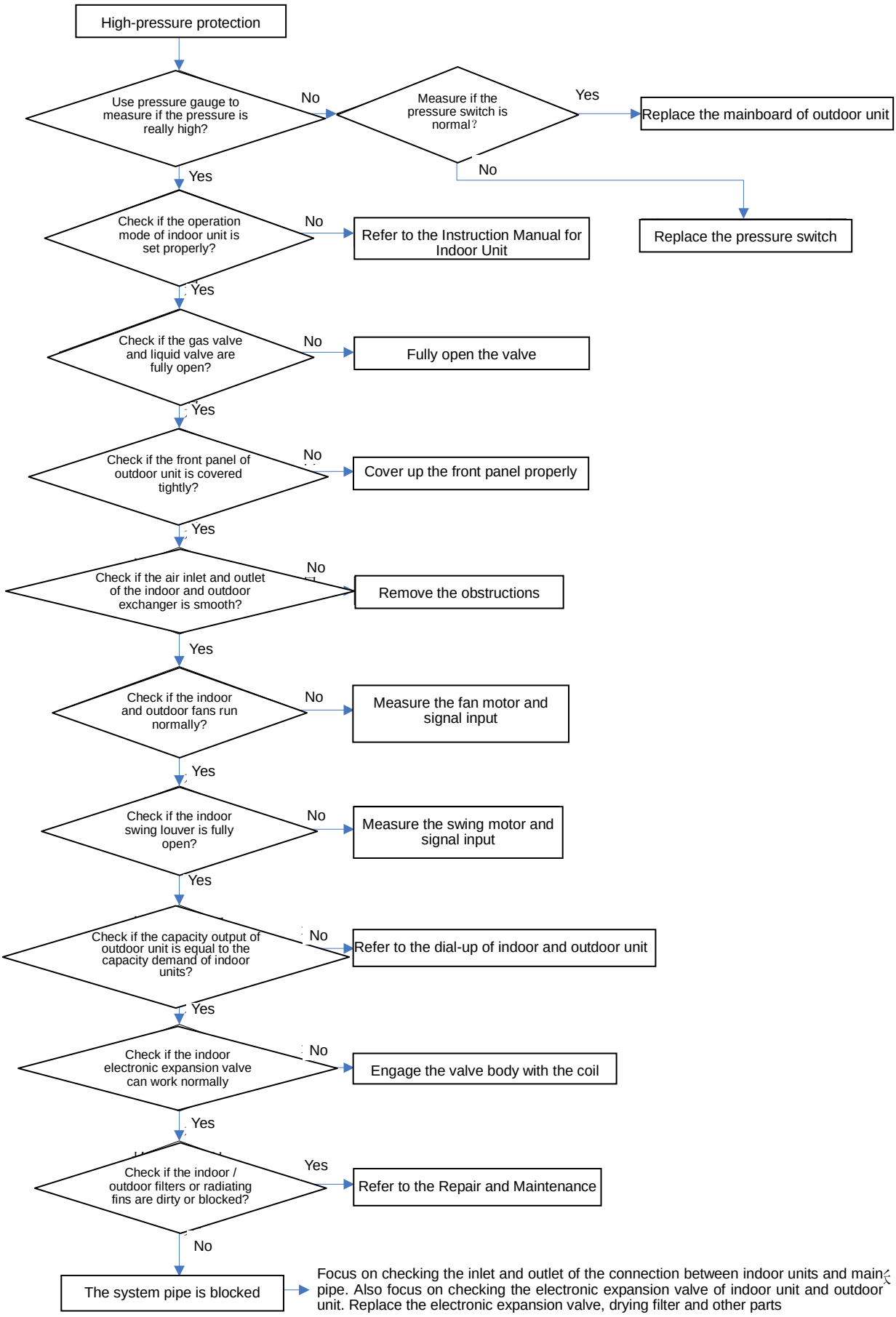
The repair personnel shall collect the error information as more as possible for careful study and list those electric or system parts that might cause the error. Then, the repair personnel shall be able to identify the specific cause of error and find out the problem parts.

Keep an eye on the complete equipment. Do not restrict to a part, but taking care to check the state of complete equipment.

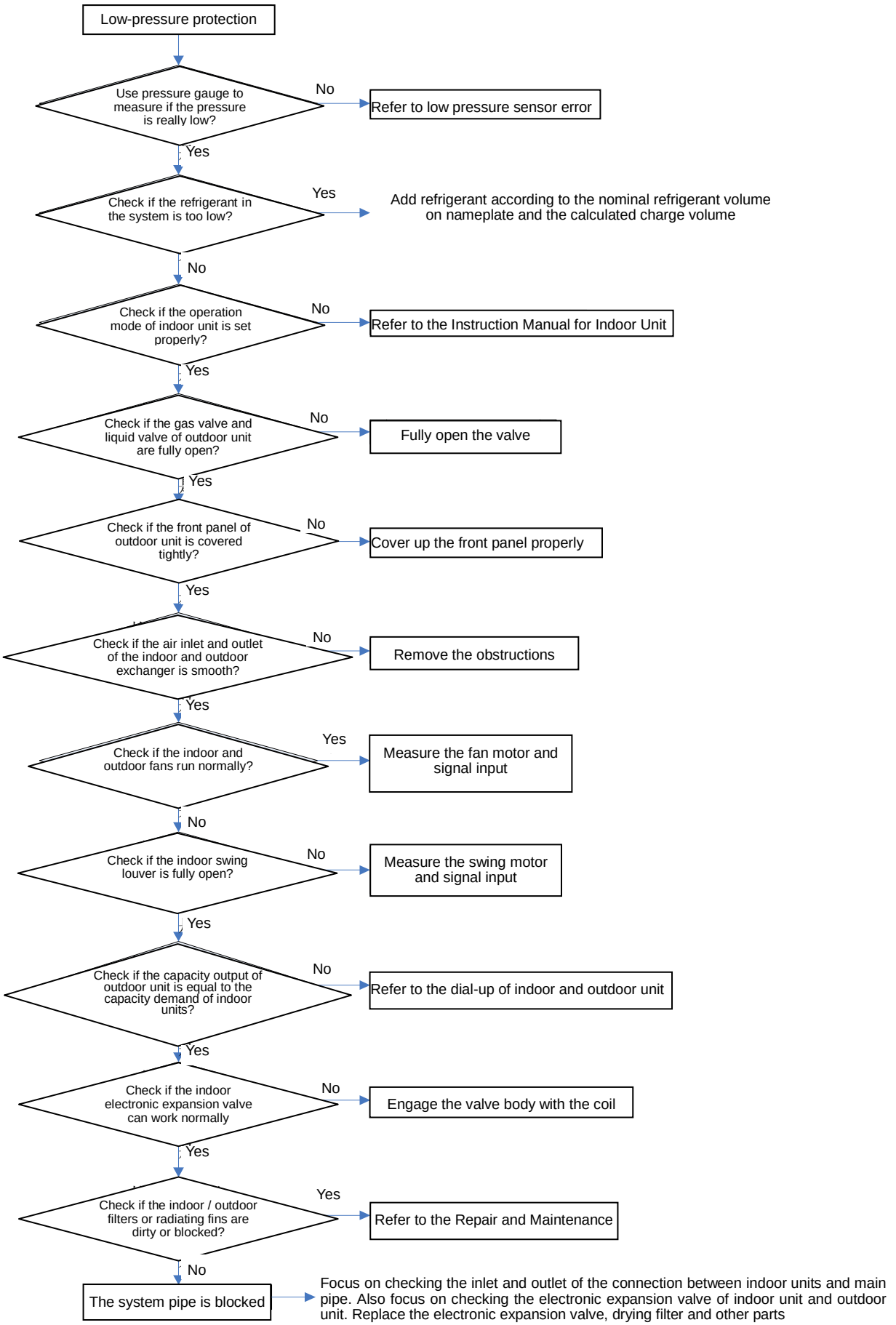
Study from the simple point. To analyze, judge and identify the cause of trouble, please start from the simple operation and finally proceed to such complicated operations as discharge of refrigerant, disassembly of equipment, replacement of parts and filling of refrigerant. Be prudent to find out the cause. The unit might be incurred to multiple errors, and such errors might be caused by multiple reasons. It is also possible that one error is developed into multiple errors. Therefore, a comprehensive analysis system shall be set up to ensure that the result of judgment is more correct and reliable.

Note: The code E5 represents different errors. Therefore, then the wired controller of indoor unit or the lamp displays E5 protection, please do not immediately cut off the power of complete unit, but checking the records of mainboard, adaptor board and drive board on outdoor side and observing the detailed display of the error lamp to identify the specific error protection.

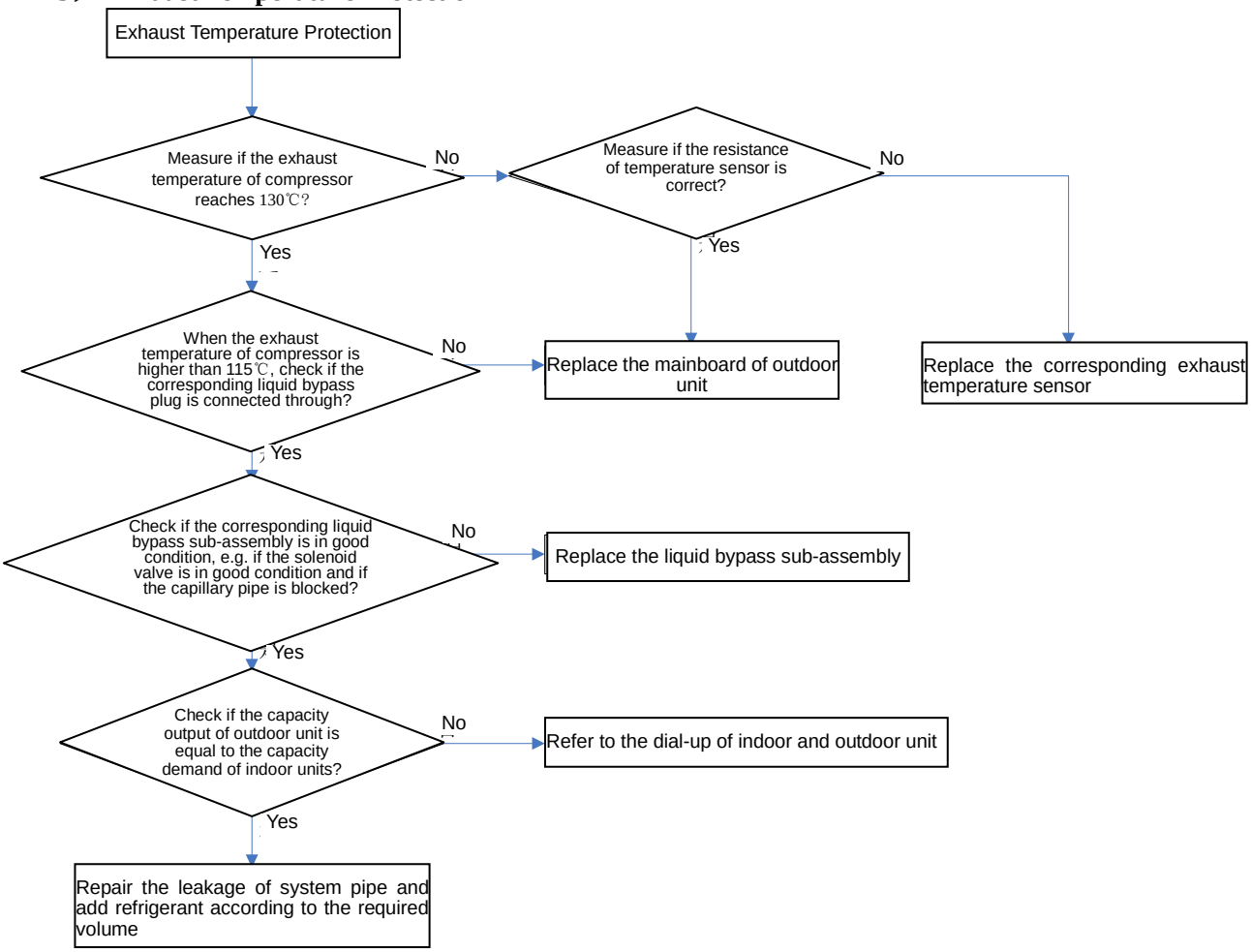
1） High-pressure protection


High-pressure protection
Use pressure gauge to measure if the pressure is really high?
No
Measure if the pressure switch is normal?
Yes
Replace the mainboard of outdoor unit
No
Replace the pressure switch
Yes
Check if the operation mode of indoor unit is set properly?
No
Refer to the Instruction Manual for Indoor Unit
Yes
Check if the gas valve and liquid valve are fully open?
No
Fully open the valve
Yes
Check if the front panel of outdoor unit is covered tightly?
No
Cover up the front panel properly
Yes
Check if the air inlet and outlet of the indoor and outdoor exchanger is smooth?
No
Remove the obstructions
Yes
Check if the indoor and outdoor fans run normally?
No
Measure the fan motor and signal input
Yes
Check if the indoor swing louver is fully open?
No
Measure the swing motor and signal input
Yes
Check if the capacity output of outdoor unit is equal to the capacity demand of indoor units?
No
Refer to the dial-up of indoor and outdoor unit
Yes
Check if the indoor electronic expansion valve can work normally
No
Engage the valve body with the coil
Yes
Check if the indoor / outdoor filters or radiating fins are dirty or blocked?
Yes
Refer to the Repair and Maintenance
No
The system pipe is blocked
Focus on checking the inlet and outlet of the connection between indoor units and main pipe. Also focus on checking the electronic expansion valve of indoor unit and outdoor unit. Replace the electronic expansion valve, drying filter and other parts

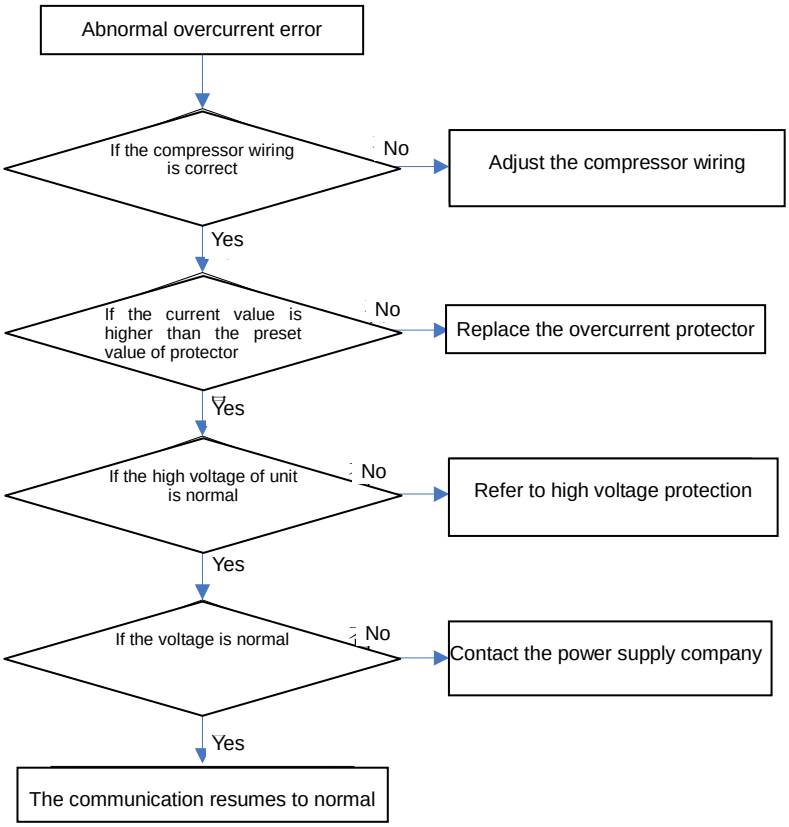
2） Low-pressure protection


Low-pressure protection
Use pressure gauge to measure if the pressure is really low?
No
Refer to low pressure sensor error
Yes
Check if the refrigerant in the system is too low?
Yes
Add refrigerant according to the nominal refrigerant volume on nameplate and the calculated charge volume
No
Check if the operation mode of indoor unit is set properly?
No
Refer to the Instruction Manual for Indoor Unit
Yes
Check if the gas valve and liquid valve of outdoor unit are fully open?
No
Fully open the valve
Yes
Check if the front panel of outdoor unit is covered tightly?
No
Cover up the front panel properly
Yes
Check if the air inlet and outlet of the indoor and outdoor exchanger is smooth?
No
Remove the obstructions
Yes
Check if the indoor and outdoor fans run normally?
Yes
Measure the fan motor and signal input
No
Check if the indoor swing louver is fully open?
No
Measure the swing motor and signal input
Yes
Check if the capacity output of outdoor unit is equal to the capacity demand of indoor units?
No
Refer to the dial-up of indoor and outdoor unit
Yes
Check if the indoor electronic expansion valve can work normally
No
Engage the valve body with the coil
Yes
Check if the indoor / outdoor filters or radiating fins are dirty or blocked?
Yes
Refer to the Repair and Maintenance
No
The system pipe is blocked
Focus on checking the inlet and outlet of the connection between indoor units and main pipe. Also focus on checking the electronic expansion valve of indoor unit and outdoor unit. Replace the electronic expansion valve, drying filter and other parts

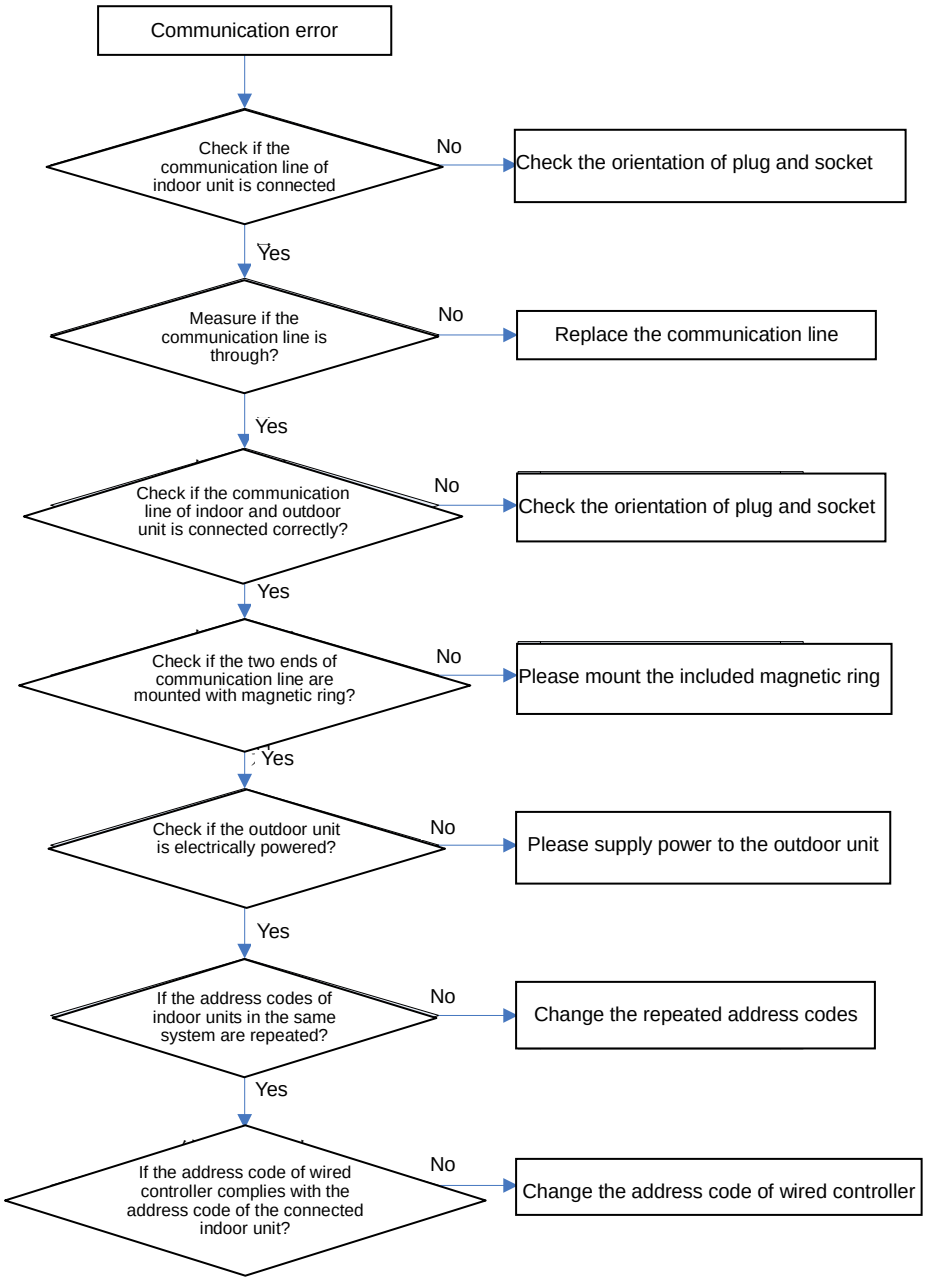
3） Exhaust Temperature Protection


Exhaust Temperature Protection
Measure if the exhaust temperature of compressor reaches 130℃?
No
Yes
Measure if the resistance of temperature sensor is correct?
No
Yes
When the exhaust temperature of compressor is higher than 115℃, check if the corresponding liquid bypass plug is connected through?
No
Yes
Replace the mainboard of outdoor unit
Replace the corresponding exhaust temperature sensor
Check if the corresponding liquid bypass sub-assembly is in good condition, e.g. if the solenoid valve is in good condition and if the capillary pipe is blocked?
No
Yes
Replace the liquid bypass sub-assembly
Check if the capacity output of outdoor unit is equal to the capacity demand of indoor units?
No
Yes
Refer to the dial-up of indoor and outdoor unit
Repair the leakage of system pipe and add refrigerant according to the required volume

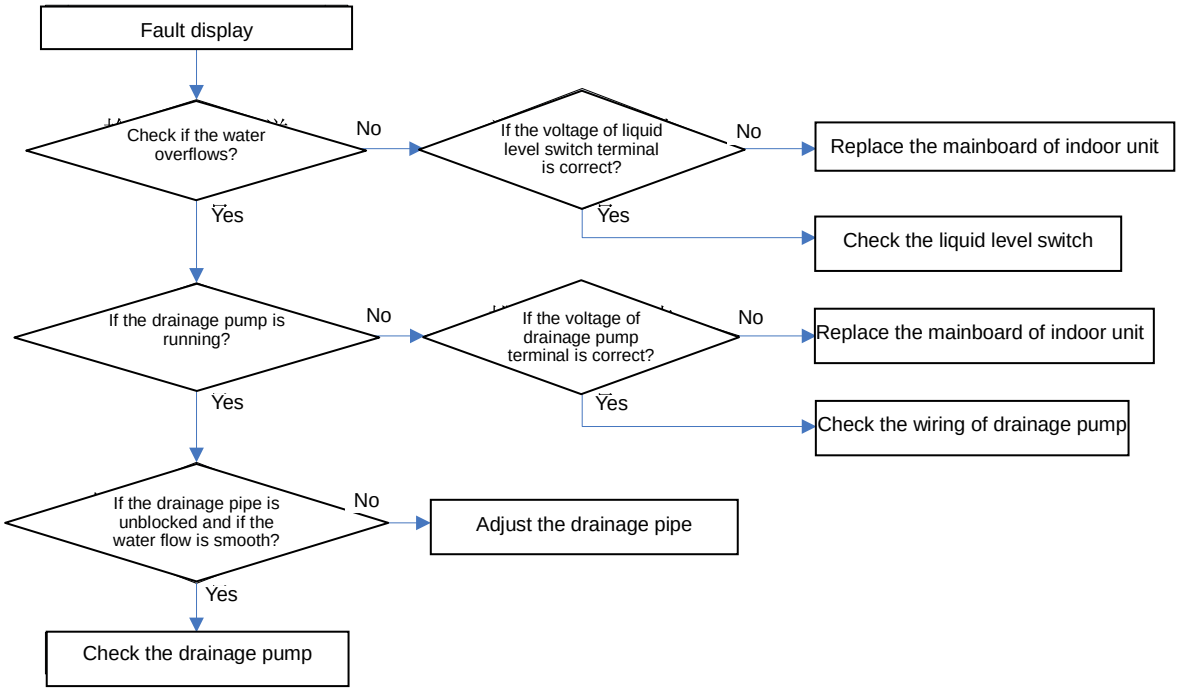
4） Compressor overcurrent protection



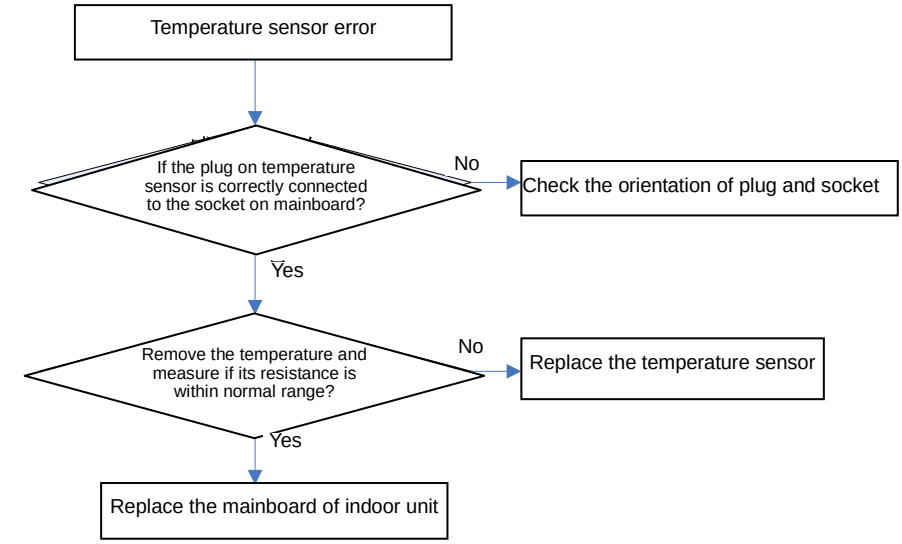
5） Communication error


Communication error
Check if the communication line of indoor unit is connected
No
Check the orientation of plug and socket
Yes
Measure if the communication line is through?
No
Replace the communication line
Yes
Check if the communication line of indoor and outdoor unit is connected correctly?
No
Check the orientation of plug and socket
Yes
Check if the two ends of communication line are mounted with magnetic ring?
No
Please mount the included magnetic ring
Yes
Check if the outdoor unit is electrically powered?
No
Please supply power to the outdoor unit
Yes
If the address codes of indoor units in the same system are repeated?
No
Change the repeated address codes
Yes
If the address code of wired controller complies with the address code of the connected indoor unit?
No
Change the address code of wired controller

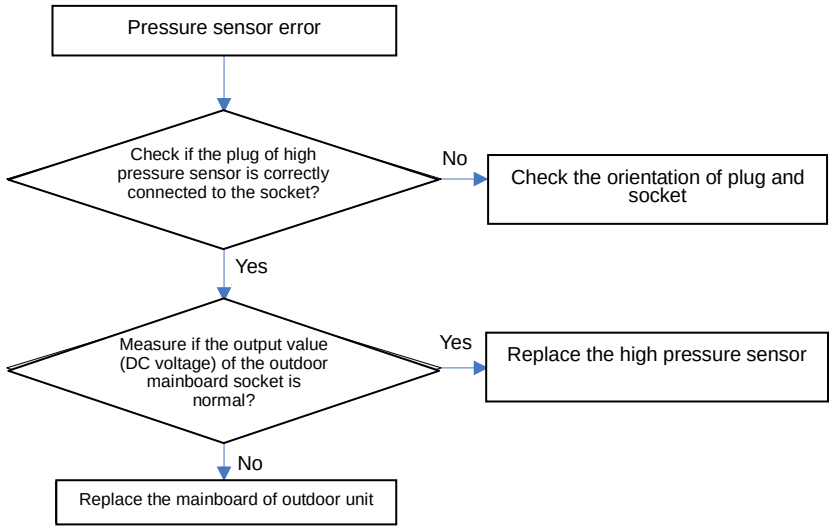
6） Water-full protection



7） Temperature sensor error

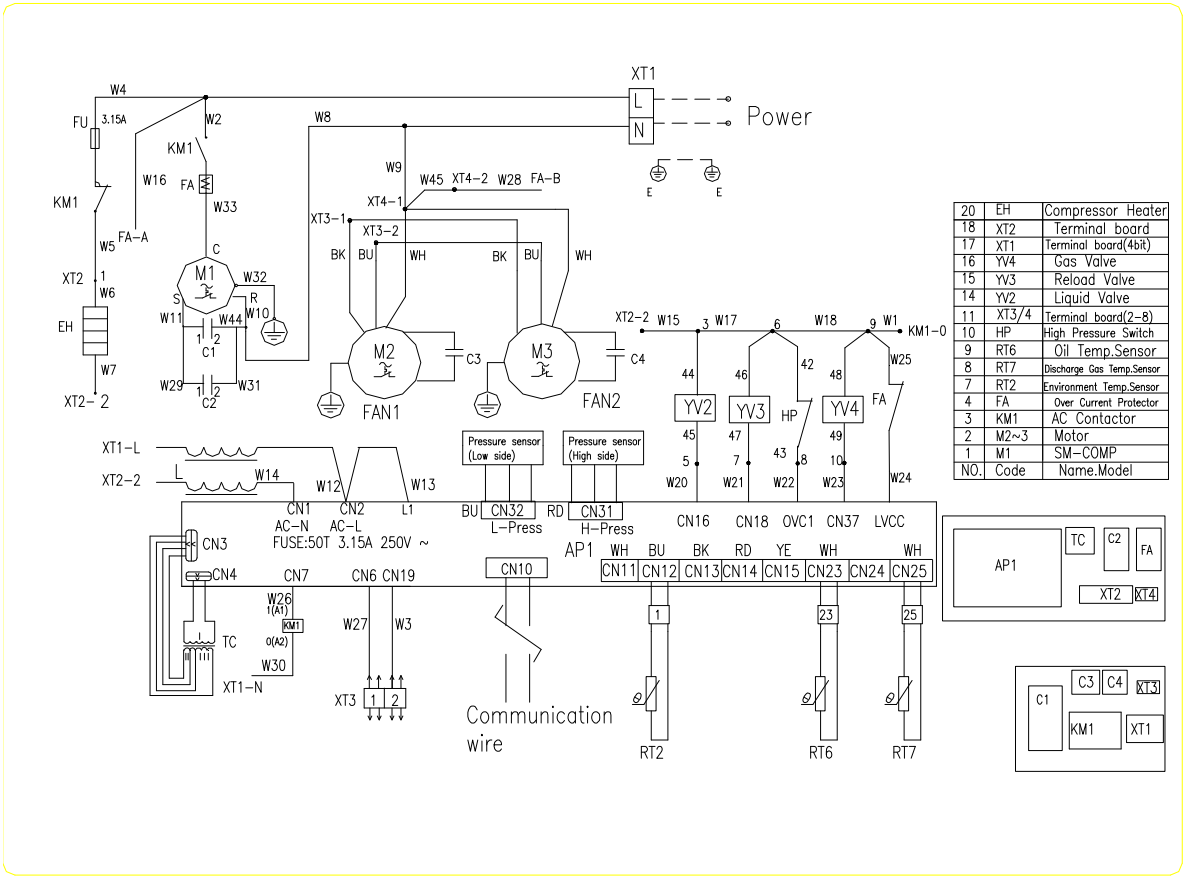

Temperature sensor error
If the plug on temperature sensor is correctly connected to the socket on mainboard?
No
Check the orientation of plug and socket
Yes
Remove the temperature and measure if its resistance is within normal range?
No
Replace the temperature sensor
Yes
Replace the mainboard of indoor unit

8） Pressure sensor error

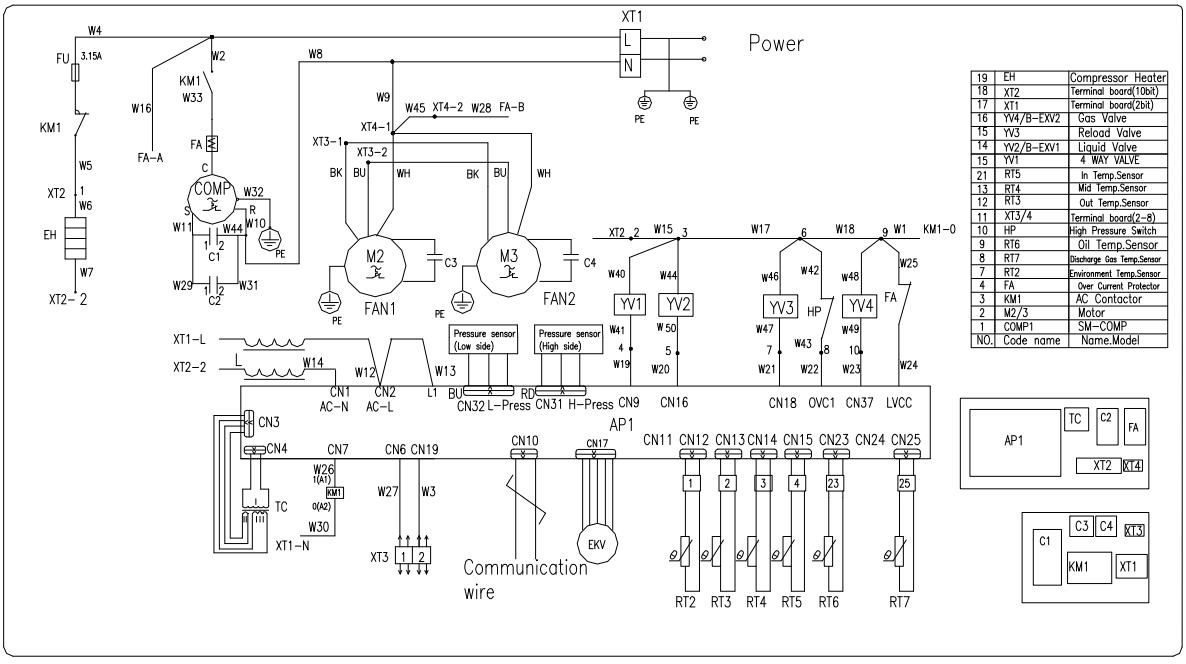

Pressure sensor error
Check if the plug of high pressure sensor is correctly connected to the socket?
No
Check the orientation of plug and socket
Yes
Measure if the output value (DC voltage) of the outdoor mainboard socket is normal?
Yes
Replace the high pressure sensor
No
Replace the mainboard of outdoor unit

3 WIRING DIADRAM

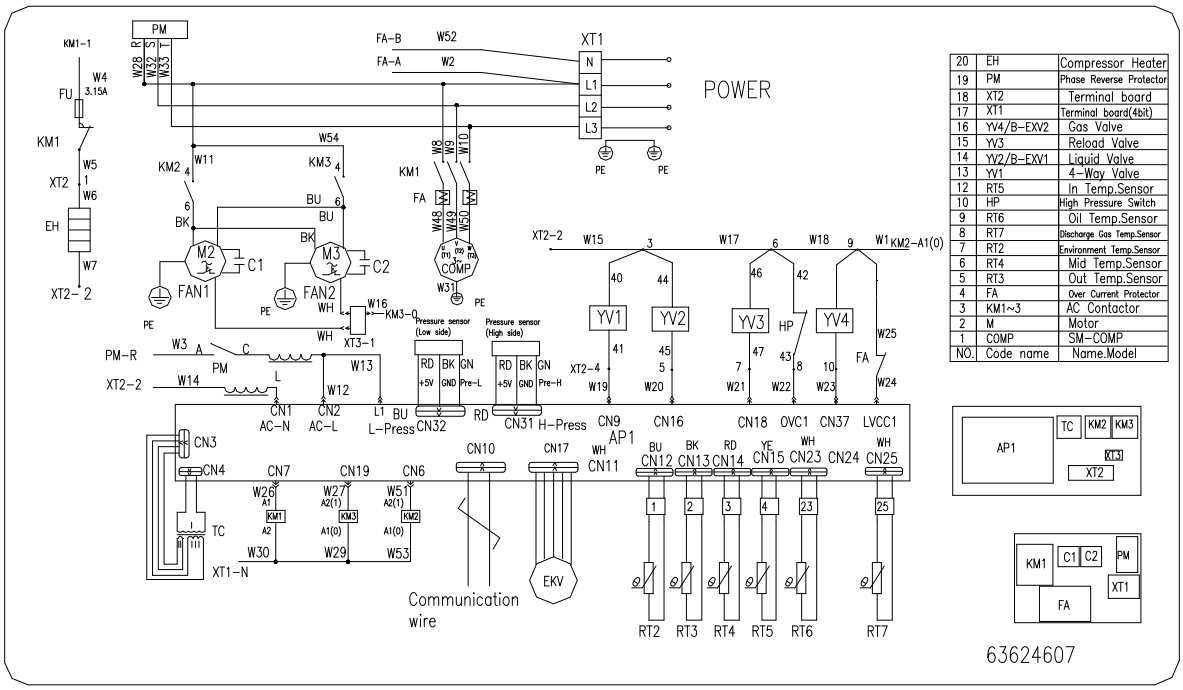
GMVL-R120W/Na-K



GMV-R120W/Na-K

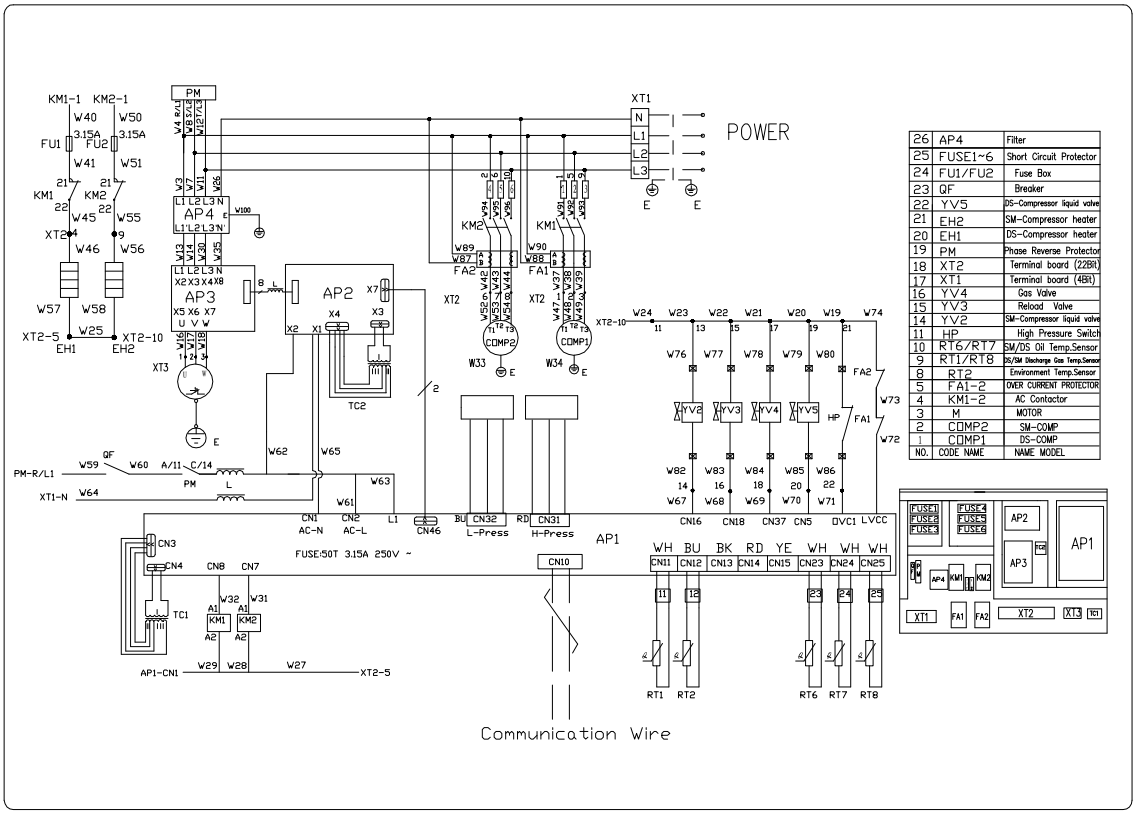


GMV-R160W/Na-M



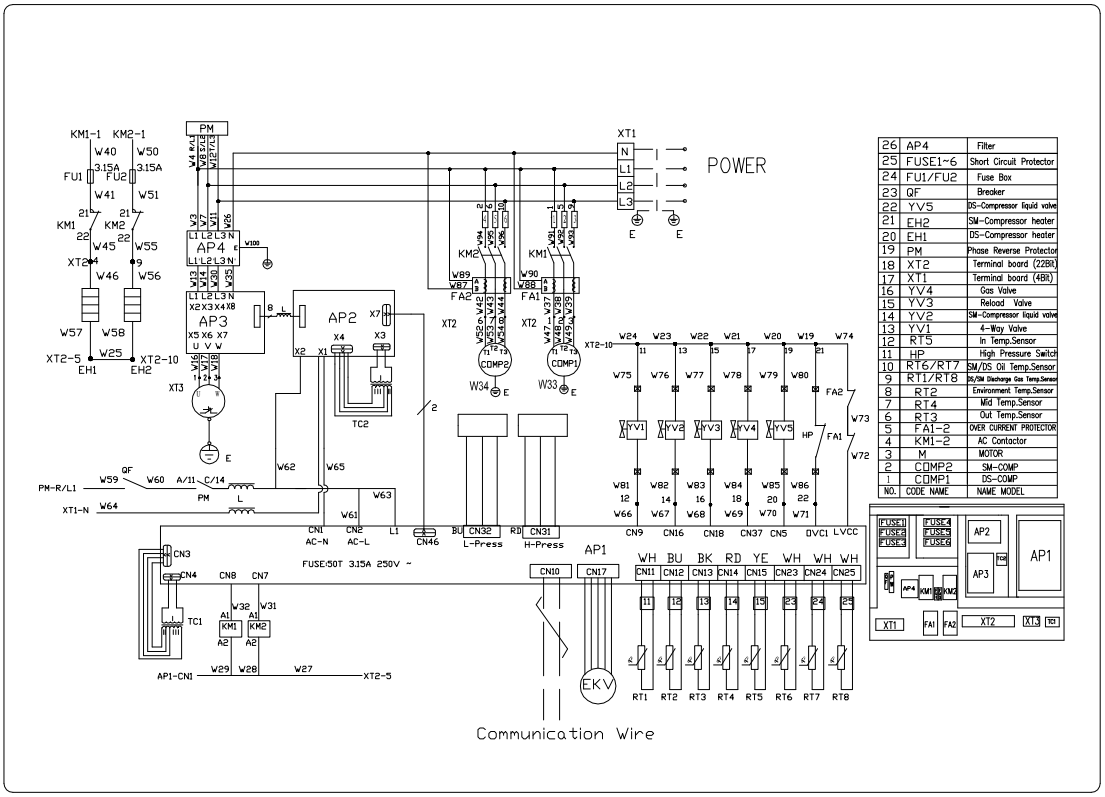
NO.	Code name	Name.Model
20	EH	Compressor Heater
19	PM	Phase Reverse Protector
18	XT2	Terminal board
17	XT1	Terminal board(4bit)
16	YV4/B-EXV2	Gas Valve
15	YV3	Reload Valve
14	YV2/B-EXV1	Liquid Valve
13	YV1	4-Way Valve
12	RT5	In Temp.Sensor
10	HP	High Pressure Switch
9	RT6	Oil Temp.Sensor
8	RT7	Discharge Gas Temp.Sensor
7	RT2	Environment Temp.Sensor
6	RT4	Mid Temp.Sensor
5	RT3	Out Temp.Sensor
4	FA	Over Current Protector
3	KM1~3	AC Contactor
2	M	Motor
1	COMP	SM-COMP

GMVL-R260W2/Na-M，GMVL-R300W2/Na-M



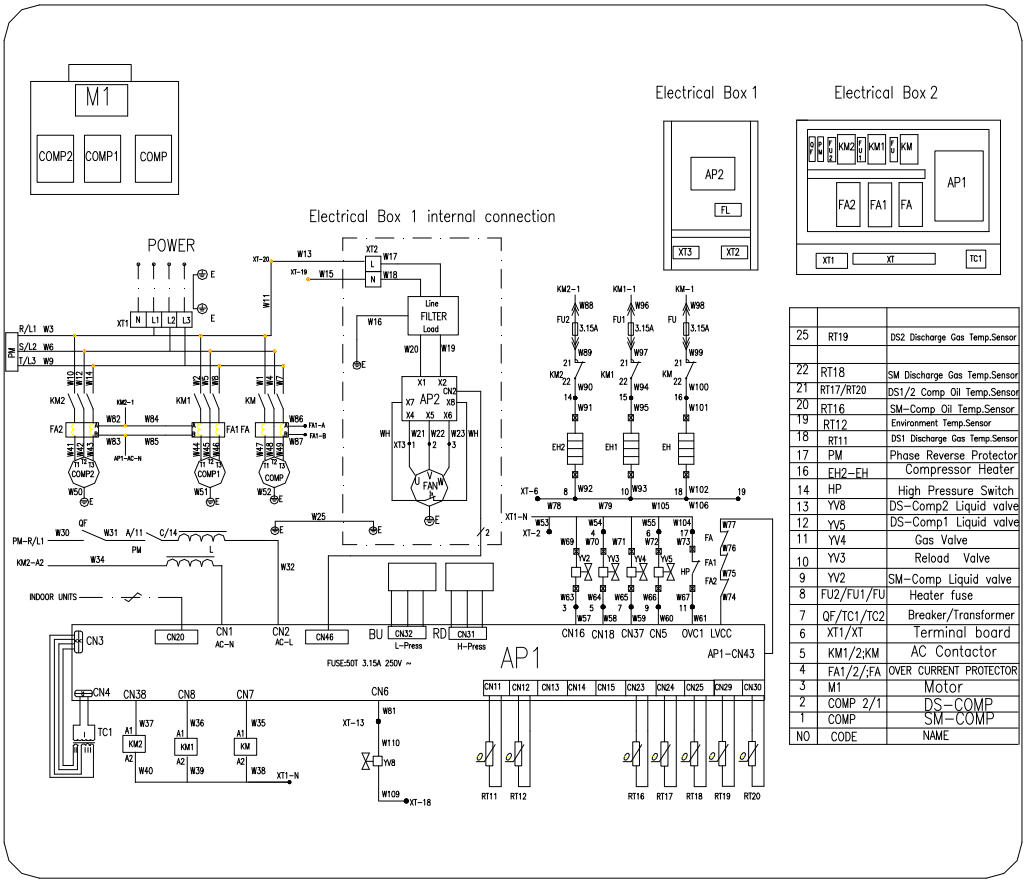
NO.	CODE NAME	NAME MODEL
26	AP4	Filter
25	FUSE1~6	Short Circuit Protector
24	FU1/FU2	Fuse Box
23	QF	Breaker
22	YV5	DS-Compressor liquid valve
21	EH2	SM-Compressor heater
20	EH1	DS-Compressor heater
19	PM	Phase Reverse Protector
18	XT2	Terminal board (22Bit)
17	XT1	Terminal board (4Bit)
16	YV4	Gas Valve
15	YV3	Reload Valve
14	YV2	SM-Compressor liquid valve
11	HP	High Pressure Switch
10	RT6/RT7	SM/DS Oil Temp.Sensor
9	RT1/RT8	DS/SM Discharge Gas Temp.Sensor
8	RT2	Environment Temp.Sensor
5	FA1-2	OVER CURRENT PROTECTOR
4	KM1-2	AC Contactor
3	M	MOTOR
2	COMP2	SM-COMP
1	COMP1	DS-COMP

GMV-R260W2/Na-M，GMV-R300W2/Na-M

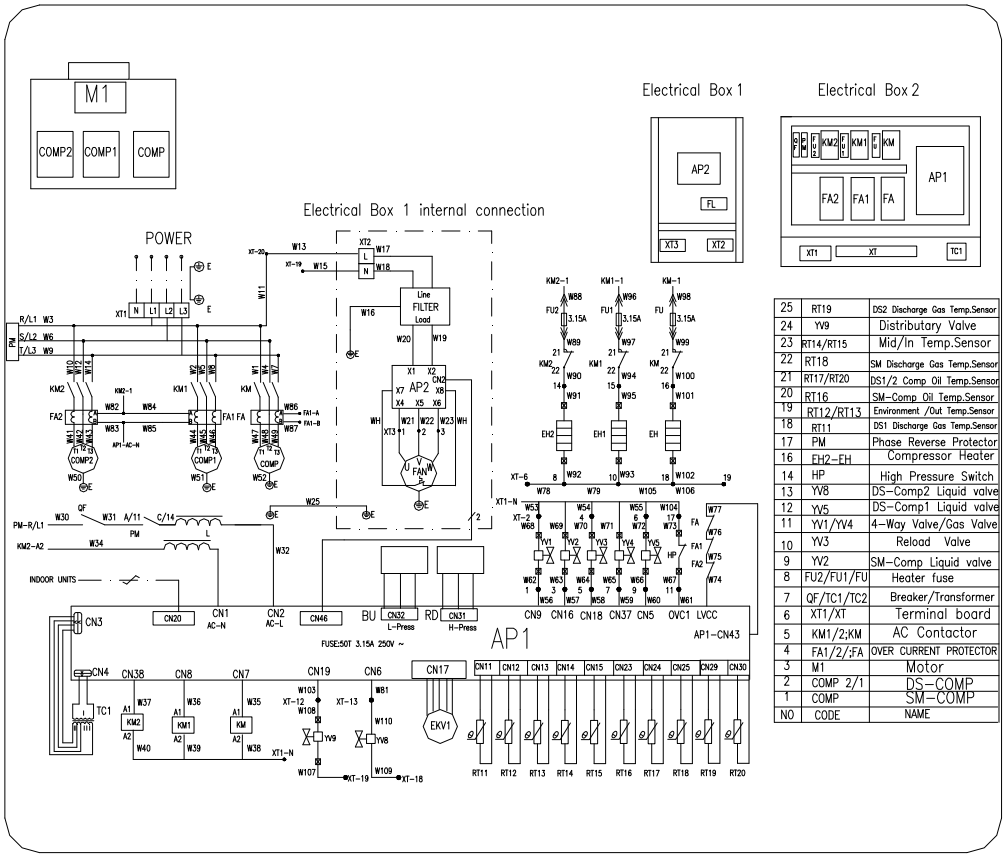


GMV

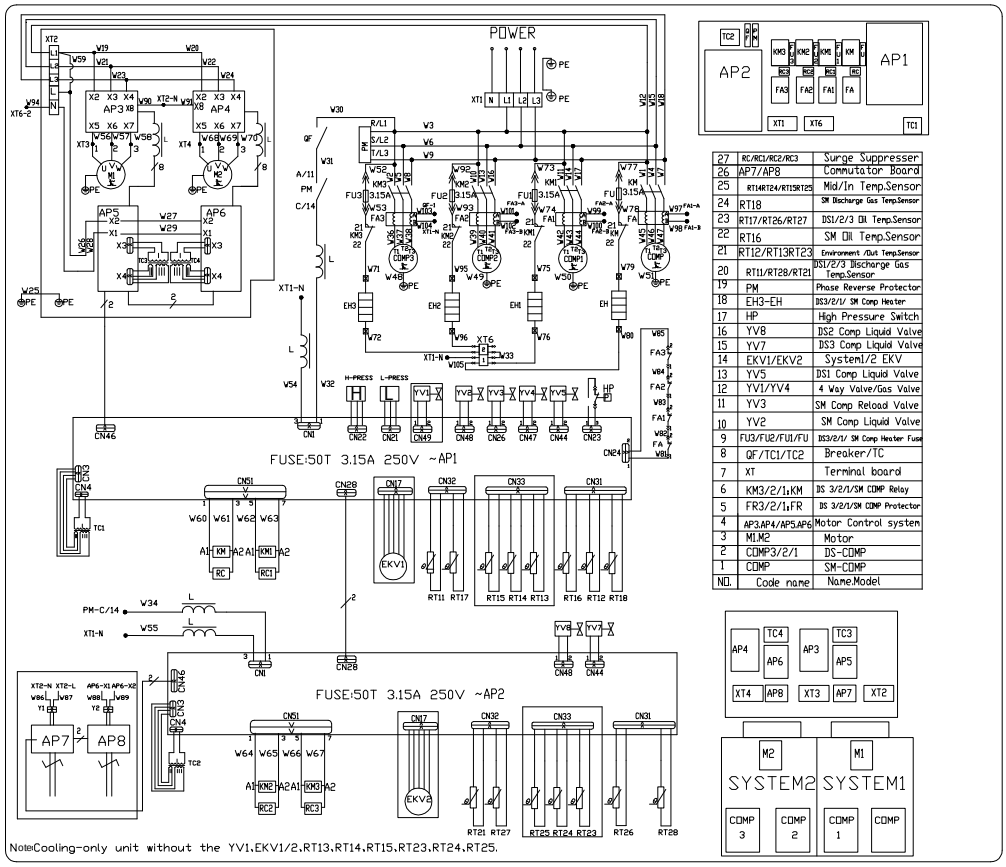
L-R450W3/Na-M



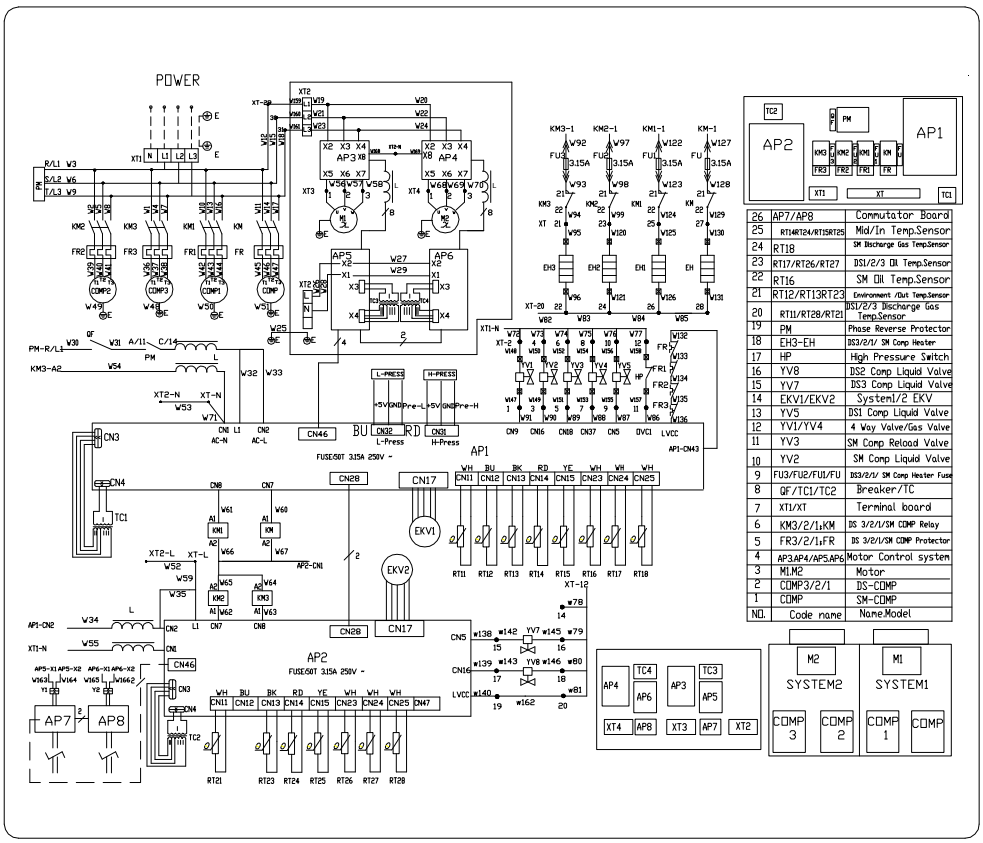
GMV-R450W3/Na-M，GMVT3-R420W3/B-M



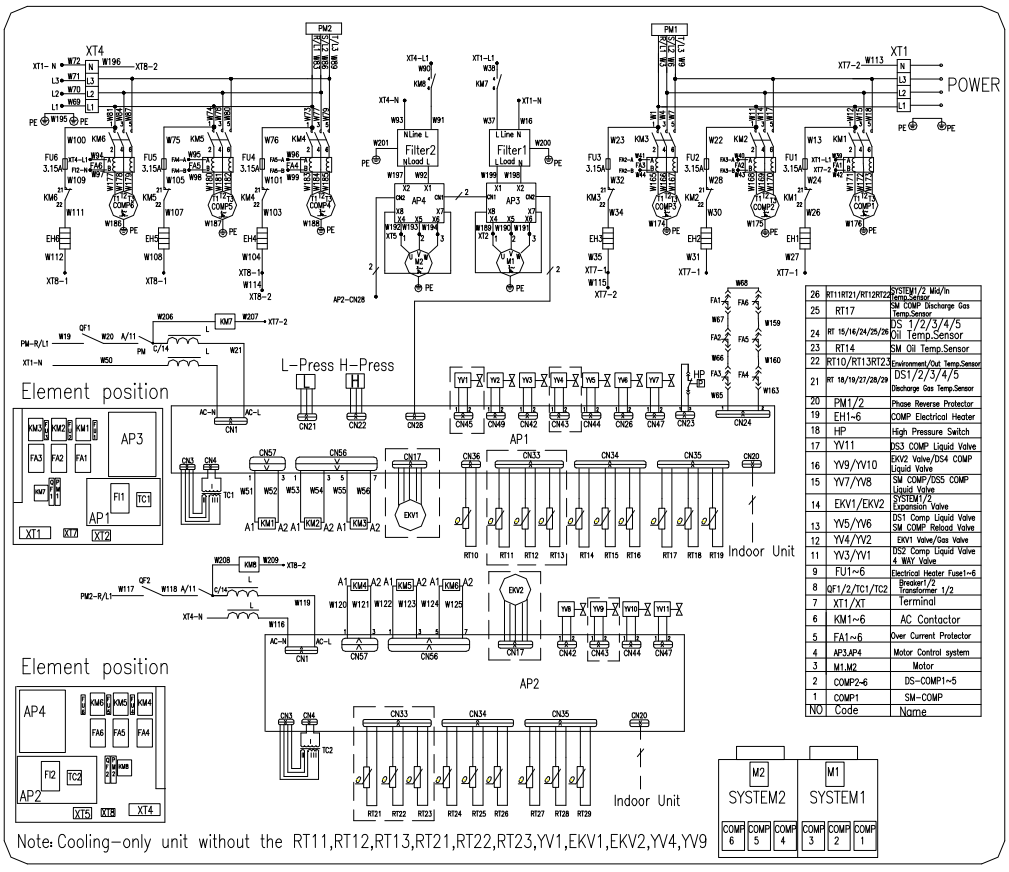
GMVL-R560W4/Na-M，GMVL-R600W4/Na-M



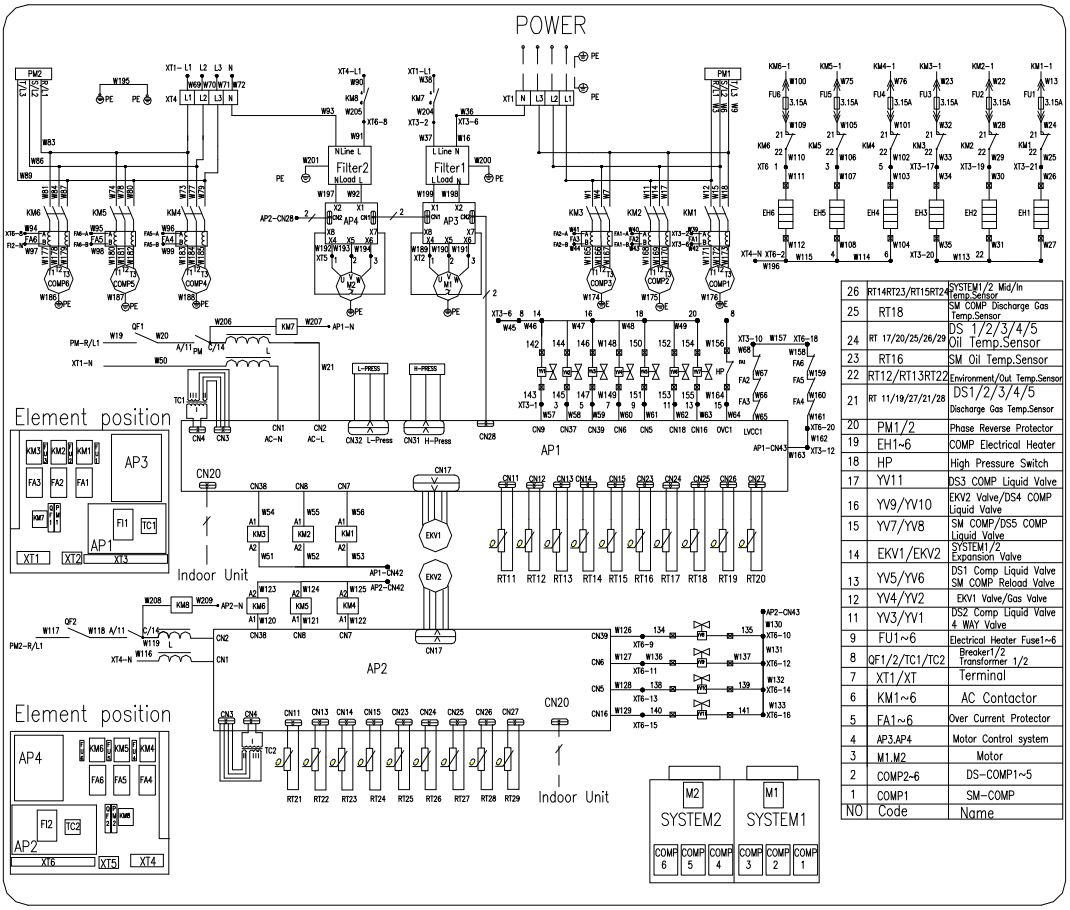
GMV-R560W4/Na-M，GMV-R600W4/Na-M



GMVL-R900W6/Na-M


POWER
Element position
Element position
Indoor Unit
Indoor Unit
SYSTEM2
SYSTEM1
Note: Cooling-only unit without the RT11,RT12,RT13,RT21,RT22,RT23,YV1,EKV1,EKV2,YV4,YV9
26 RT11RT21/RT12RT22 SYSTEM1/2 Mid/In Temp.Sensor
25 RT17 SM COMP Discharge Gas Temp.Sensor
24 RT 15/16/24/25/26 DS 1/2/3/4/5 Oil Temp.Sensor
23 RT14 SM Oil Temp.Sensor
22 RT10/RT13RT23 Environment/Out Temp.Sensor
21 RT 18/19/27/28/29 DS1/2/3/4/5 Discharge Gas Temp.Sensor
20 PM1/2 Phase Reverse Protector
19 EH1~6 COMP Electrical Heater
18 HP High Pressure Switch
17 YV11 DS3 COMP Liquid Valve
16 YV9/YV10 EKV2 Valve/DS4 COMP Liquid Valve
15 YV7/YV8 SM COMP/DS5 COMP Liquid Valve
14 EKV1/EKV2 SYSTEM1/2 Expansion Valve
13 YV5/YV6 DS1 Comp Liquid Valve SM COMP Reload Valve
12 YV4/YV2 EKV1 Valve/Gas Valve
11 YV3/YV1 DS2 Comp Liquid Valve 4 WAY Valve
9 FU1~6 Electrical Heater Fuse1~6
8 QF1/2/TC1/TC2 Breaker1/2 Transformer 1/2
7 XT1/XT Terminal
6 KM1~6 AC Contactor
5 FA1~6 Over Current Protector
4 AP3,AP4 Motor Control system
3 M1,M2 Motor
2 COMP2-6 DS-COMP1~5
1 COMP1 SM-COMP
NO Code Name

GMV-R900W6/Na-M

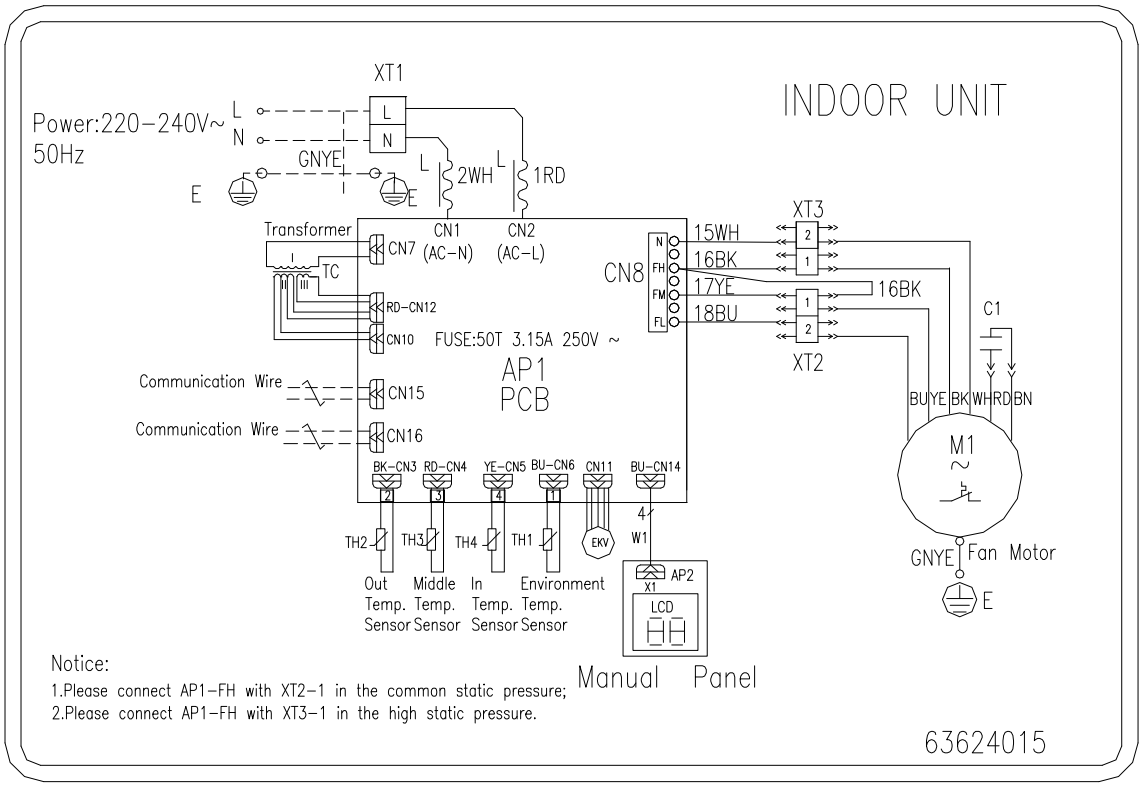


26	RT14RT23/RT15RT24	SYSTEM1/2 Mid/In Temp.Sensor
25	RT18	SM COMP Discharge Gas Temp.Sensor
24	RT 17/20/25/26/29	DS 1/2/3/4/5 Oil Temp.Sensor
23	RT16	SM Oil Temp.Sensor
22	RT12/RT13RT22	Environment/Out Temp.Sensor
21	RT 11/19/27/21/28	DS1/2/3/4/5 Discharge Gas Temp.Sensor
20	PM1/2	Phase Reverse Protector
19	EH1~6	COMP Electrical Heater
18	HP	High Pressure Switch
17	YV11	DS3 COMP Liquid Valve
16	YV9/YV10	EKV2 Valve/DS4 COMP Liquid Valve
15	YV7/YV8	SM COMP/DS5 COMP Liquid Valve
14	EKV1/EKV2	SYSTEM1/2 Expansion Valve
13	YV5/YV6	DS1 Comp Liquid Valve SM COMP Reload Valve
12	YV4/YV2	EKV1 Valve/Gas Valve
11	YV3/YV1	DS2 Comp Liquid Valve 4 WAY Valve
9	FU1~6	Electrical Heater Fuse1~6
8	QF1/2/TC1/TC2	Breaker1/2 Transformer 1/2
7	XT1/XT	Terminal
6	KM1~6	AC Contactor
5	FA1~6	Over Current Protector
4	AP3.AP4	Motor Control system
3	M1.M2	Motor
2	COMP2~6	DS-COMP1~5
1	COMP1	SM-COMP
NO	Code	Name

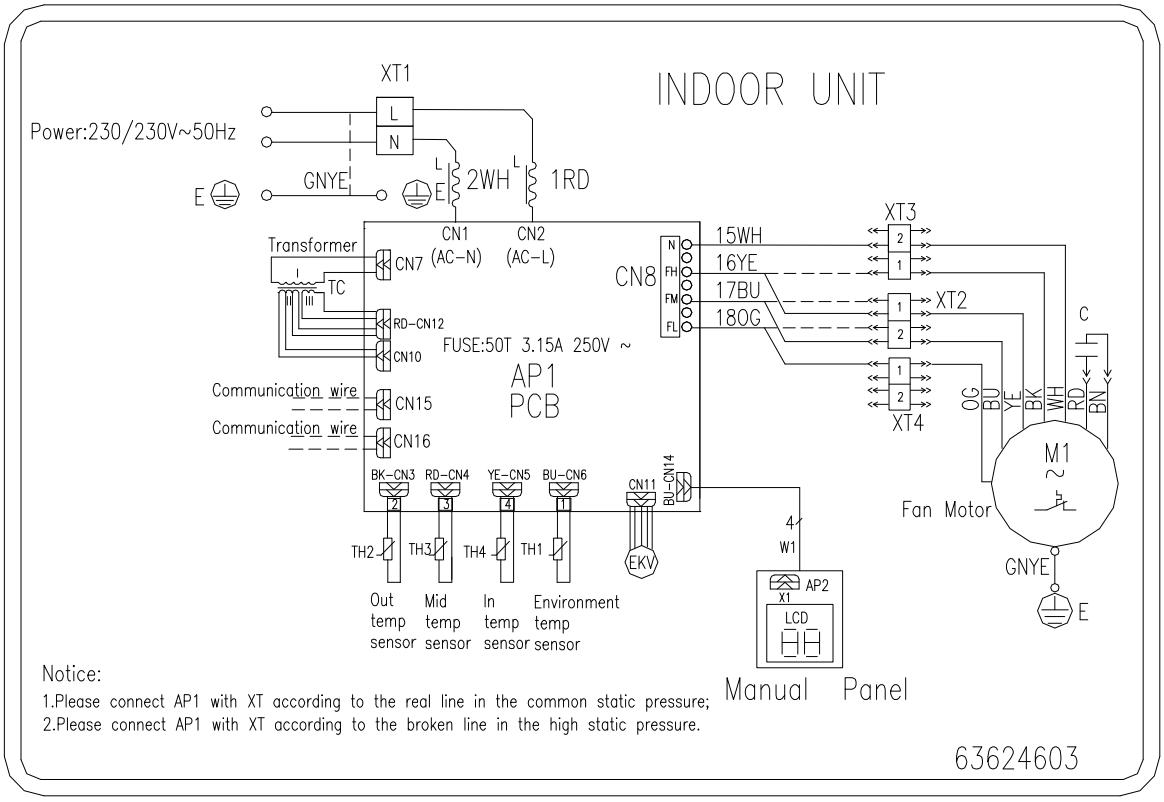
Indoor unit

Indoor Unit Circuit Diagram

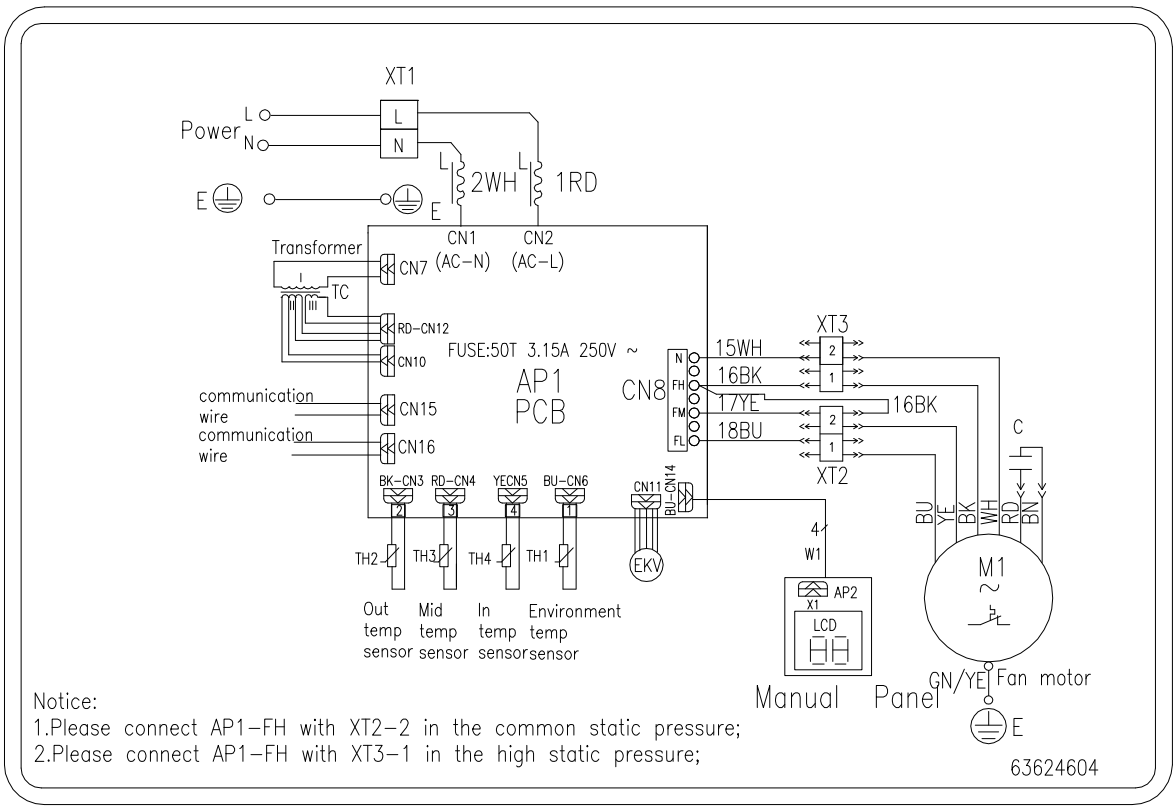
GMV-R22P/Na-K, GMV-R25P/Na-K, GMV-R28P/Na-K, GMV-R36P/Na-K, GMVL-R22P/Na-K, GMVL-R25P/Na-K, GMVL-R28P/Na-K, GMVL-R36P/Na-K



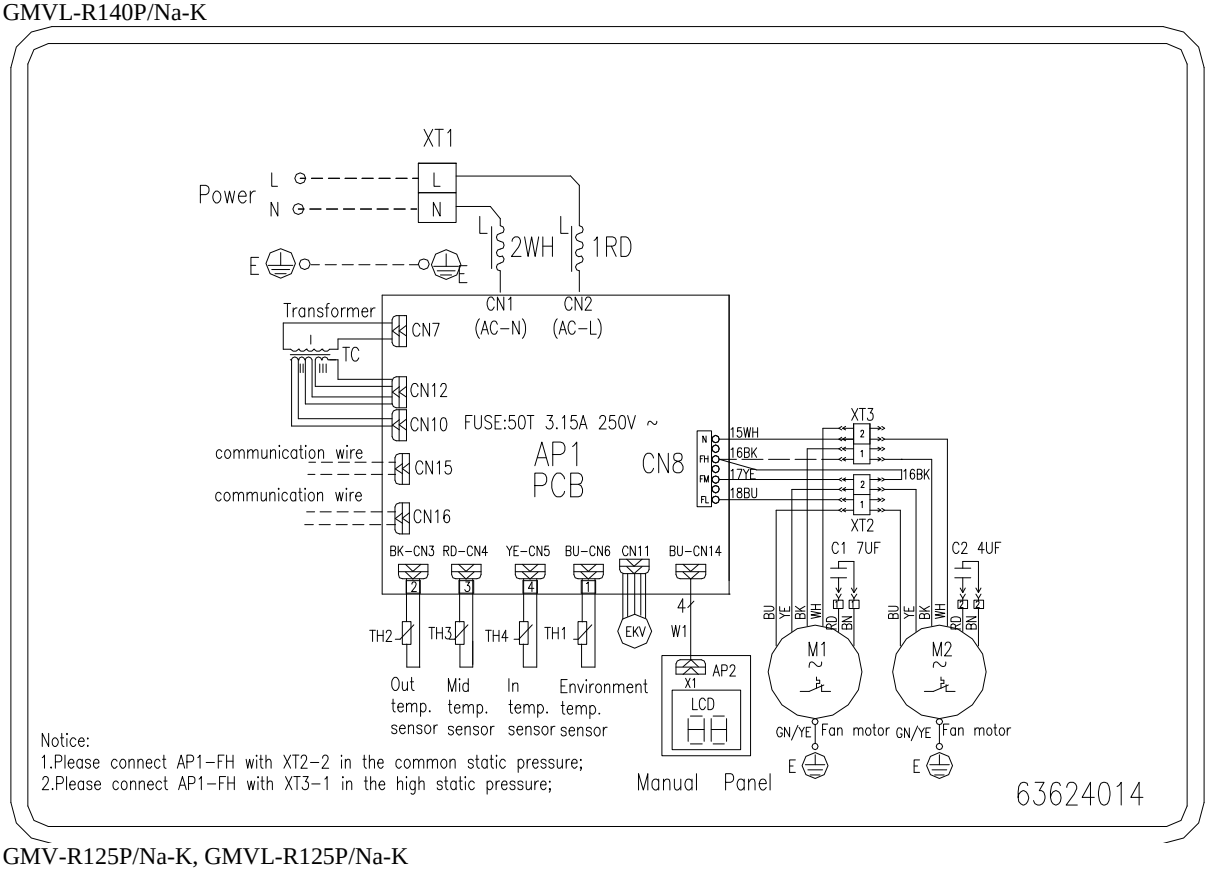
GMV-R45P/Na-K , GMV-R50P/Na-K, GMVL-R45P/Na-K GMVL-R50P/Na-K,



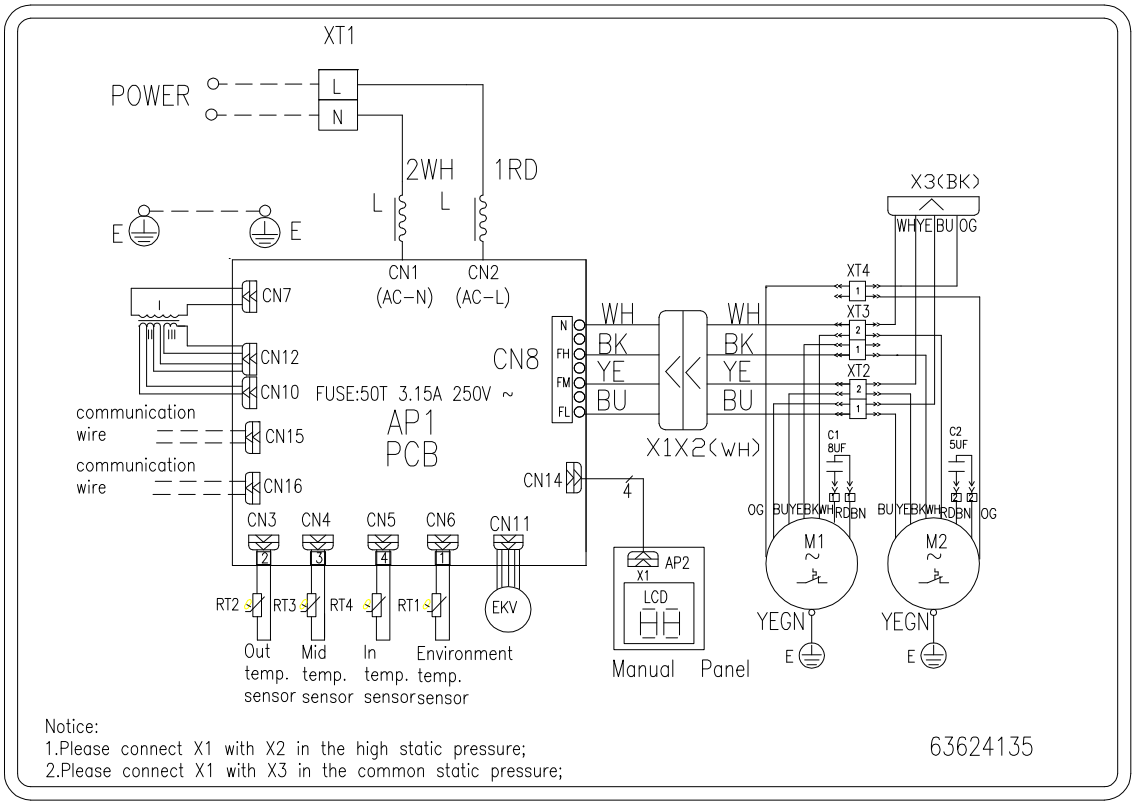
GMV-R56P/Na-K, GMV-R71P/Na-K, GMV-R80P/Na-K, GMVL-R56P/Na-K, GMVL-R71P/Na-K, GMVL-R80P/Na-K



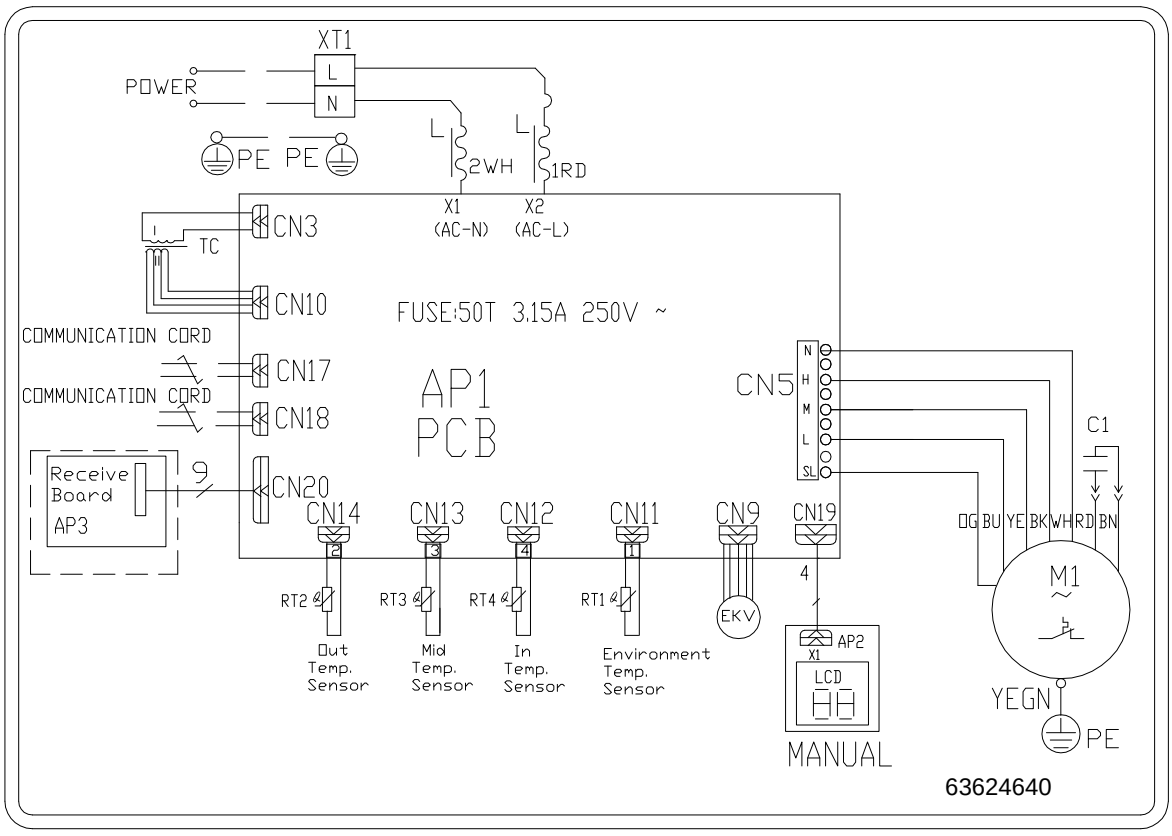
GMV-R90P/Na-K, GMV-R112P/Na-K, GMV-R140P/Na-K, GMVL-R90P/Na-K, GMVL-R112P/Na-K, GMVL-R140P/Na-K



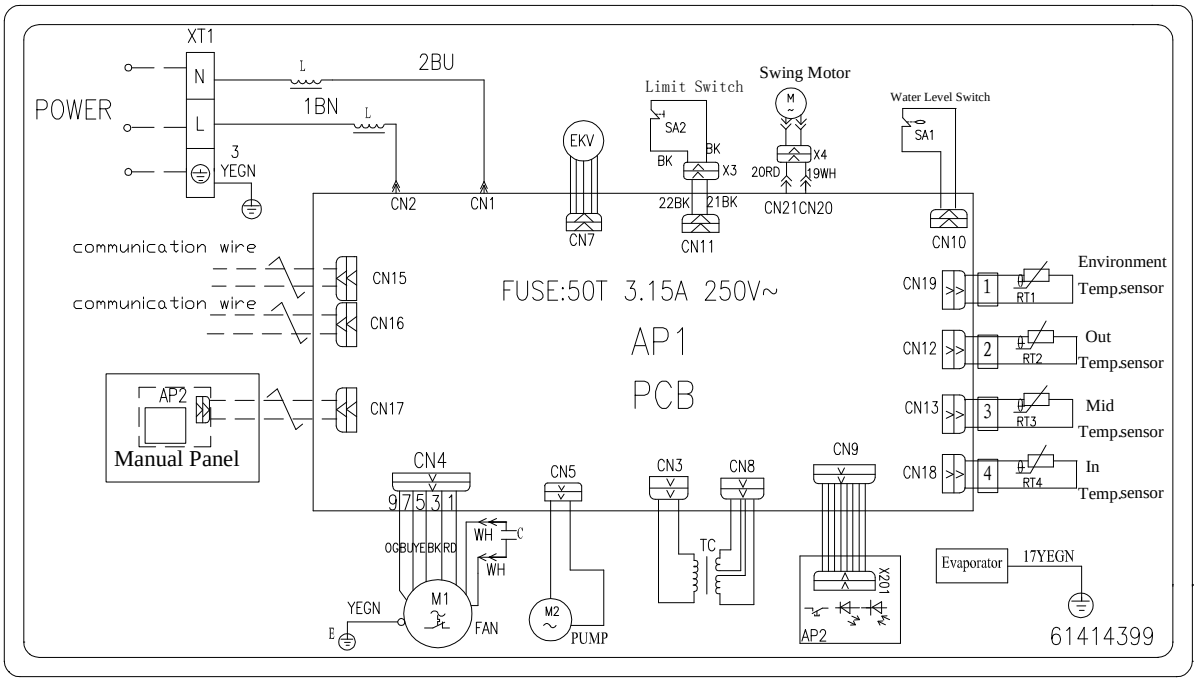
GMV-R125P/Na-K, GMVL-R125P/Na-K


XT1
POWER
L
N
2WH
1RD
E
E
CN1
(AC-N)
CN2
(AC-L)
CN7
CN12
CN10
CN15
CN16
CN8
FUSE:50T 3.15A 250V ~
AP1
PCB
communication
wire
communication
wire
CN3
CN4
CN5
CN6
CN11
CN14
RT2
RT3
RT4
RT1
EKV
Out
temp.
sensor
Mid
temp.
sensor
In
temp.
sensor
Environment
temp.
sensor
N
FH
FM
FL
WH
BK
YE
BU
X1X2(WH)
X3(BK)
WH YE BU OG
XT4
XT3
XT2
C1
8UF
C2
5UF
OG BU YE BK WH RD BN
BU YE BK WH RD BN OG
M1
M2
YEGN
YEGN
E
E
AP2
X1
LCD
Manual Panel
Notice:
1.Please connect X1 with X2 in the high static pressure;
2.Please connect X1 with X3 in the common static pressure;
63624135

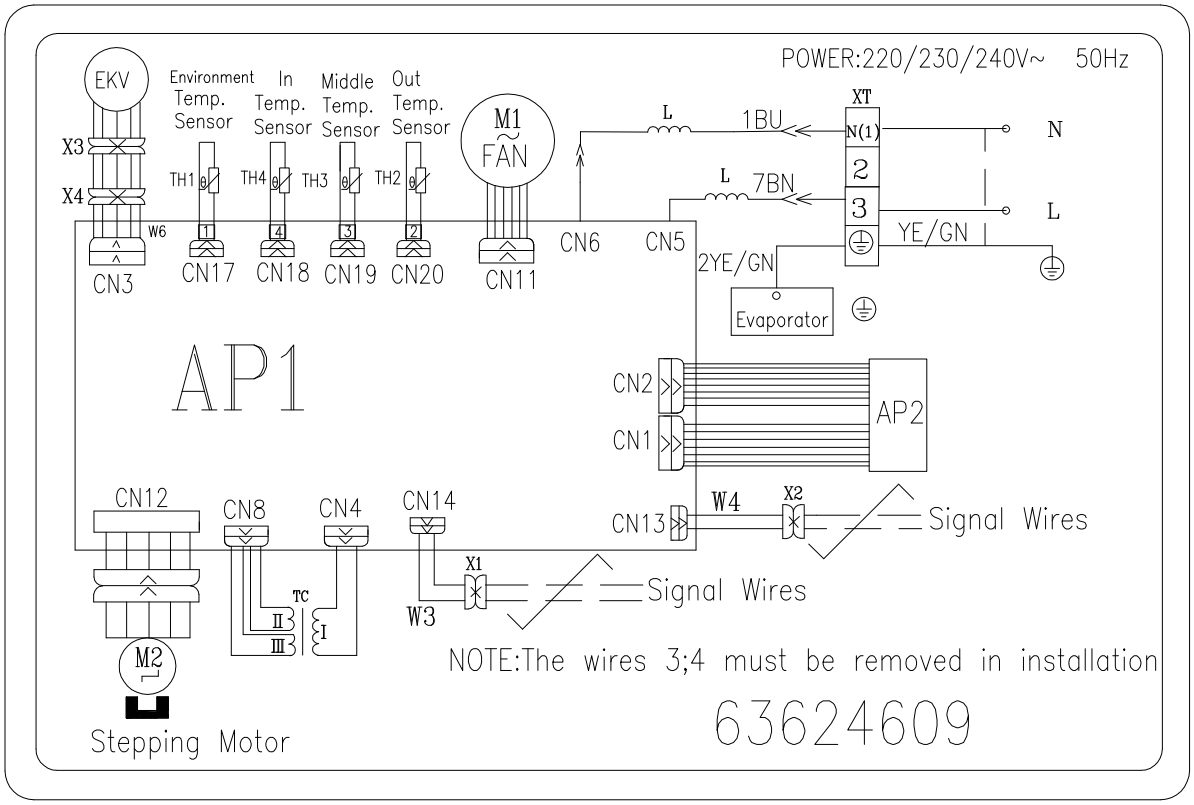
GMV-R22P/NaB-K, GMV-R25P/NaB-K, GMV-R28P/NaB-K, GMV-R32P/NaB-K, GMV-R36P/NaB-K,



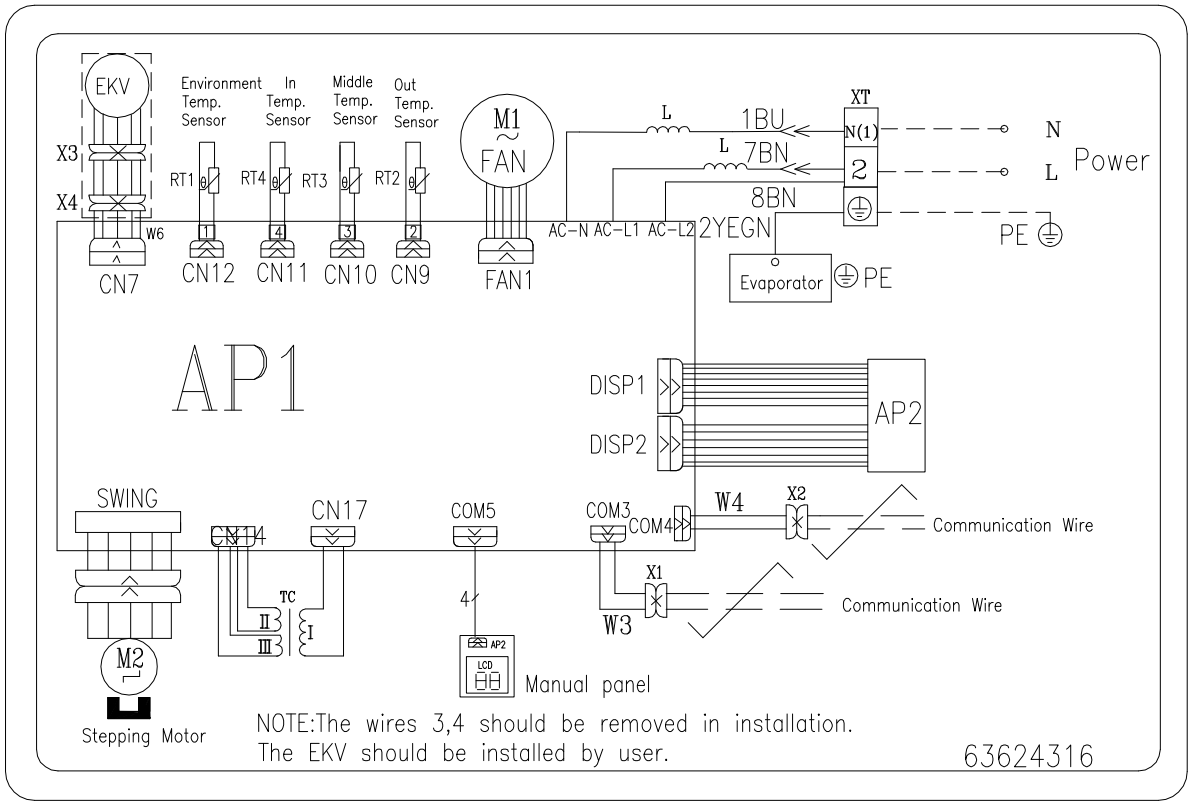
GMV-R28T/Na-K, GMV-R36T/Na-K, GMV-R45T/Na-K, GMV-R50T/Na-K, GMV-R56T/Na-K, GMV-R71T/Na-K, GMV-R80T/Na-K, GMV-R90T/Na-K, GMV-R112T/Na-K, GMV-R125T/Na-K, GMVL-R28T/Na-K, GMVL-R36T/Na-K, GMVL-R45T/Na-K, GMVL-R50T/Na-K, GMVL-R56T/Na-K, GMVL-R71T/Na-K, GMVL-R80T/Na-K, GMVL-R90T/Na-K, GMVL-R112T/Na-K, GMVL-R125T/Na-K



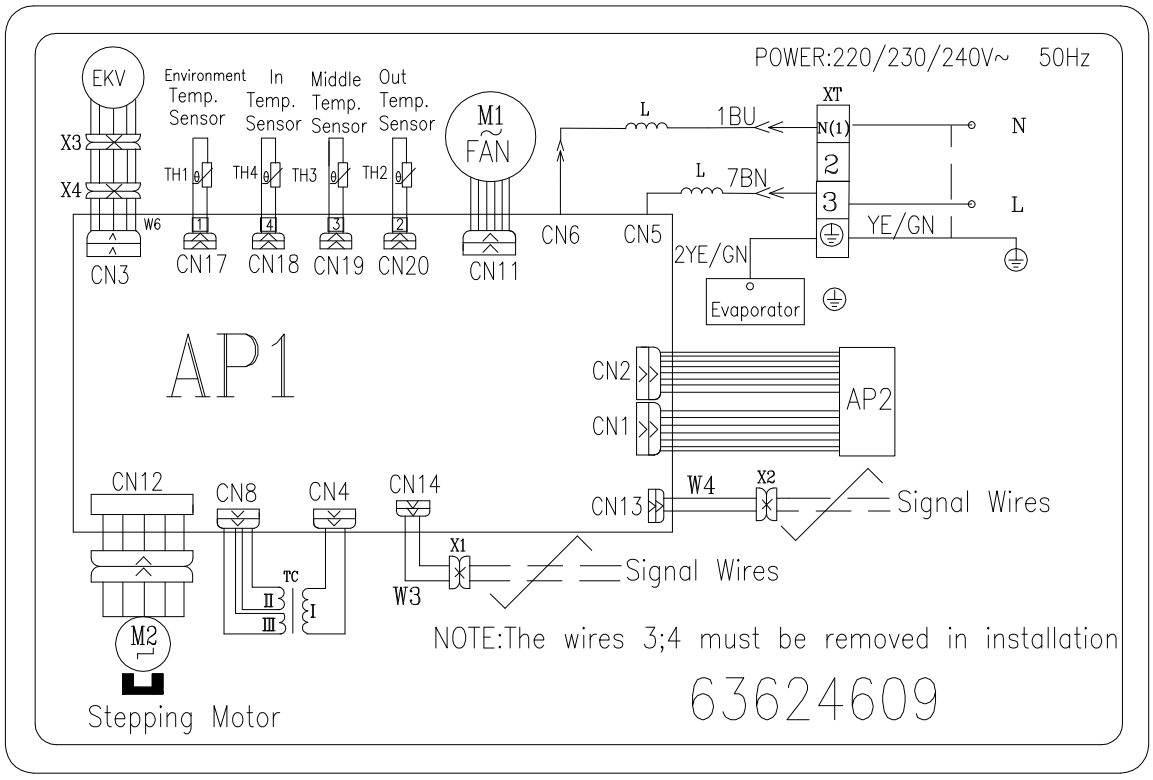
GMV-R22G/NaB-K, GMVL-R22G/NaB-K, GMV-R28G/NaB-K, GMVL-R28G/NaB-K, GMV-R36G/NaB-K, GMVL-R36G/NaB-K, GMV-R45G/NaB-K, GMVL-R45G/NaB-K



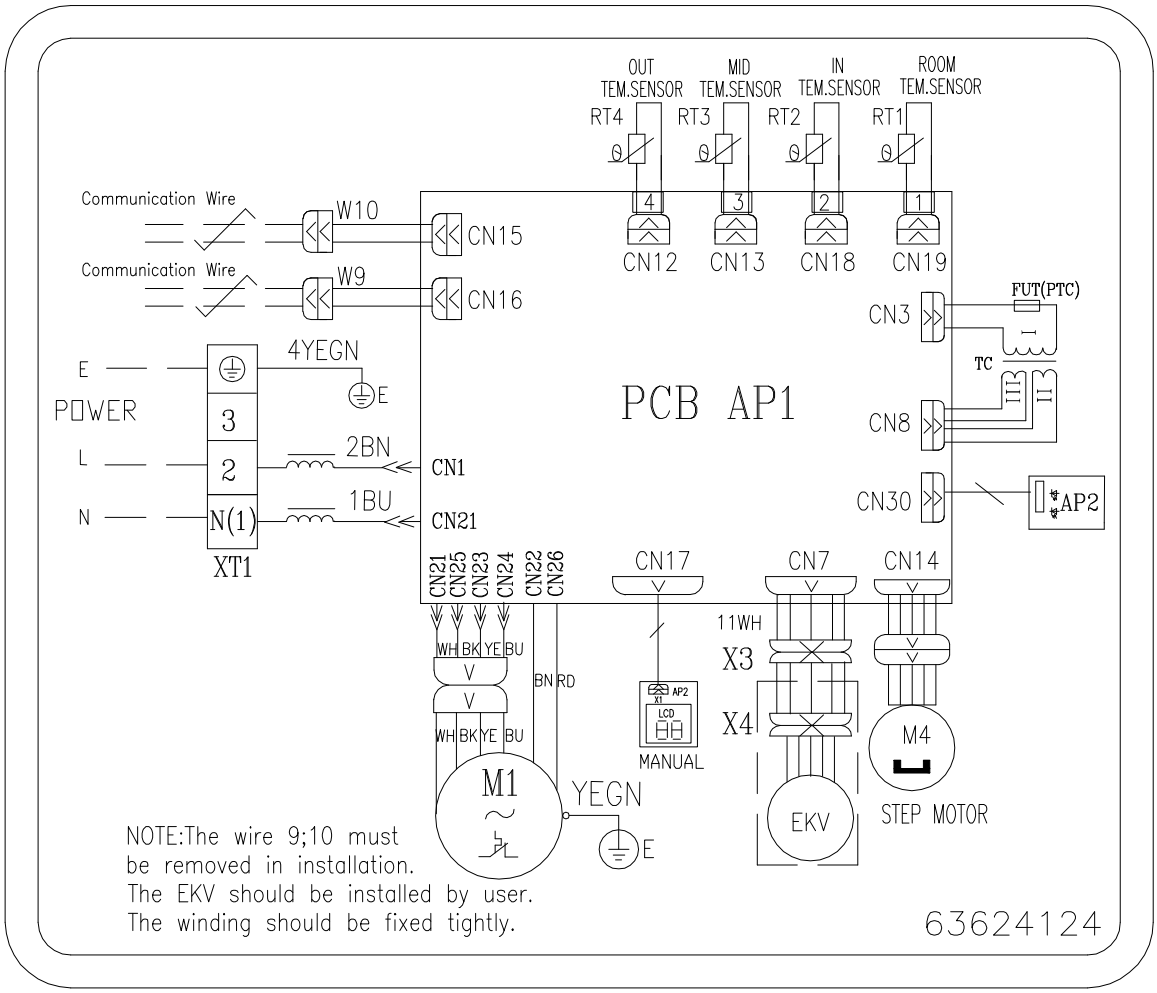
GMV-R50G/NaB-K, GMV-R56G/NaB-K, GMVL-R50G/NaB-K, GMVL-R56G/NaB-K



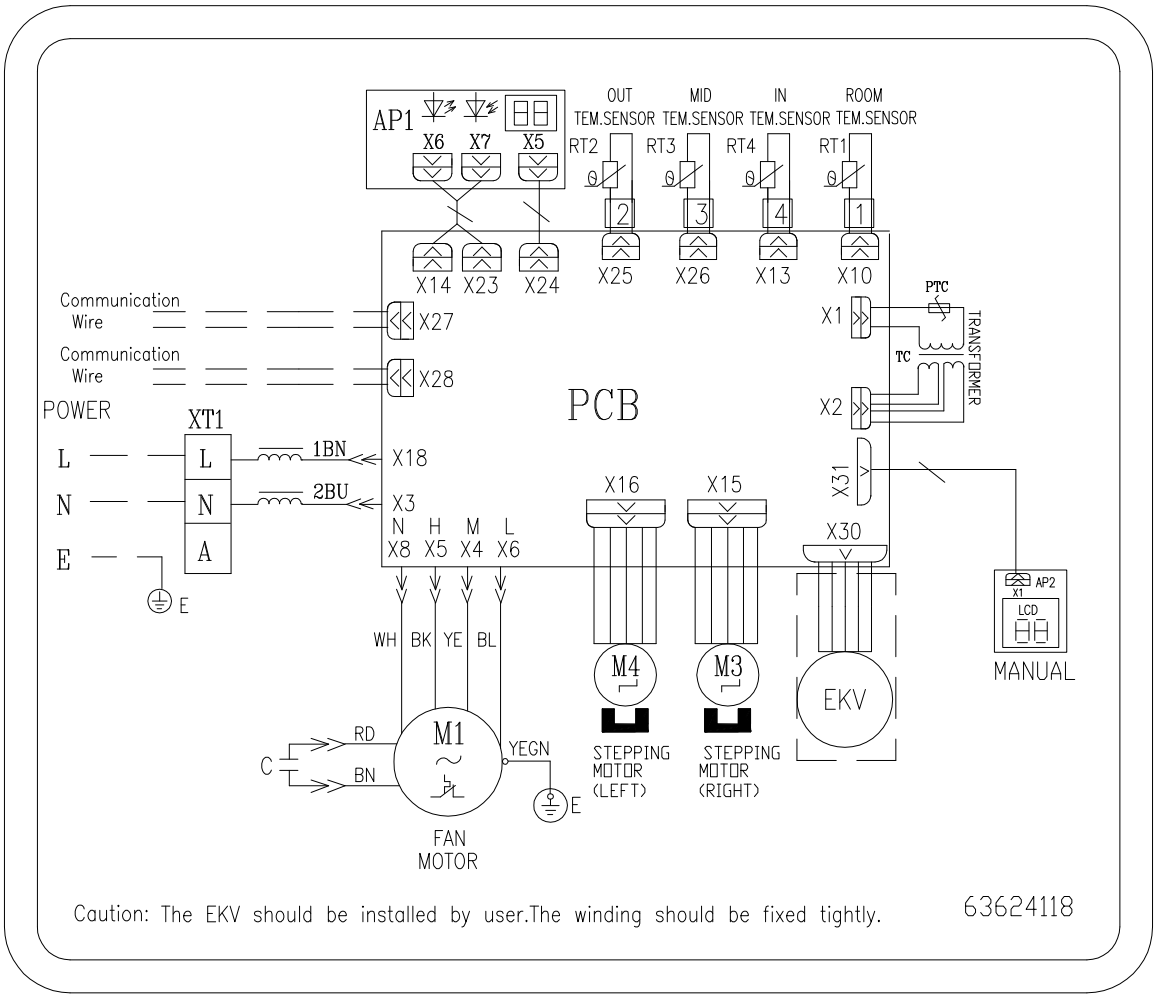
GMV-R22G/NaC-K, GMV-R28G/NaC-K , GMV-R36G/NaC-K, GMV-R45G/NaC-K, GMVL-R22G/NaC-K, GMVL-R28G/NaC-K , GMVL-R36G/NaC-K, GMVL-R45G/NaC-K



GMV-R71G/Na-K, GMV-R80G/Na-K, GMVL-R71G/Na-K, GMVL-R80G/Na-K

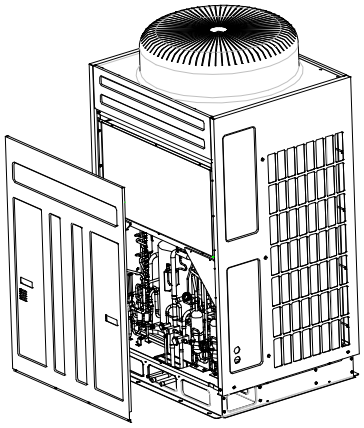
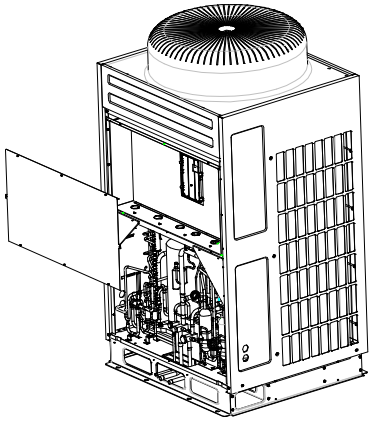
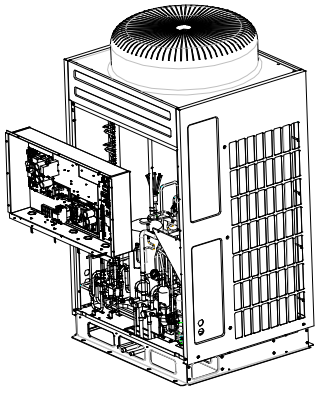


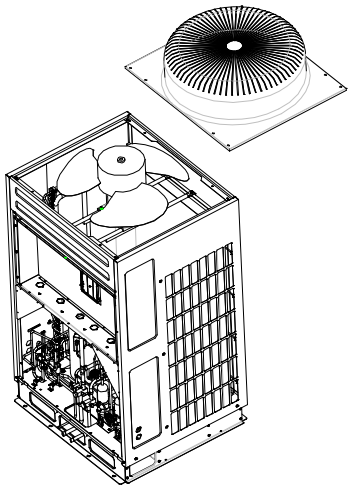
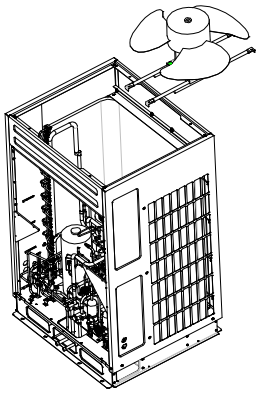
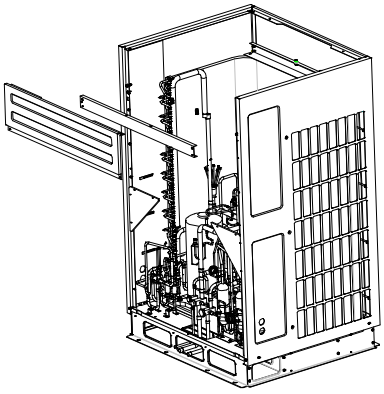
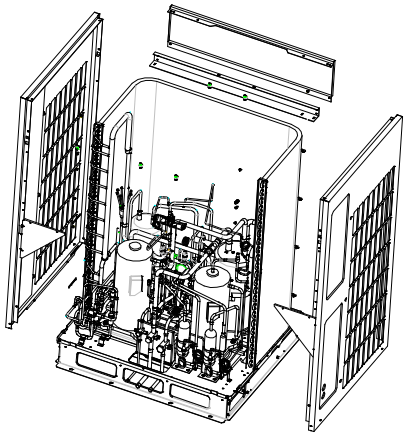
GMV-R28Zd/Na-K, GMV-R36Zd/Na-K, GMV-R50Zd/Na-K, GMV-R71Zd/Na-K, GMV-R90Zd/Na-K, GMV-R112Zd/Na-K, GMV-R125Zd/Na-K, GMVL-R28Zd/Na-K, GMVL-R36Zd/Na-K, GMVL-R50Zd/Na-K, GMVL-R71Zd/Na-K, GMVL-R90Zd/Na-K, GMVL-R112Zd/Na-K, GMVL-R125Zd/Na-K

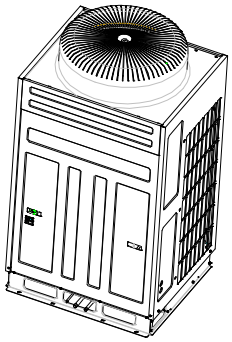


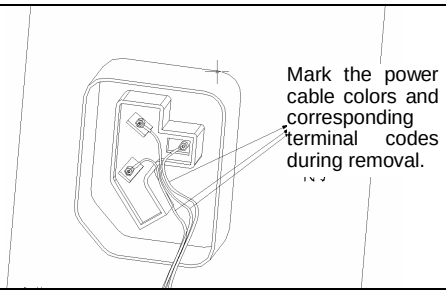
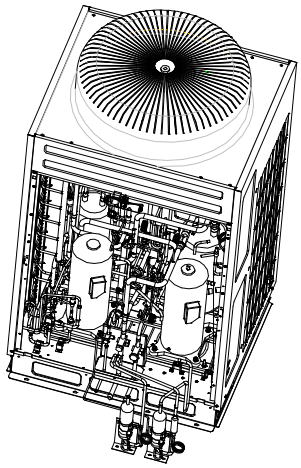
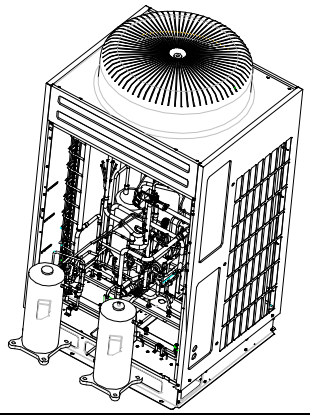
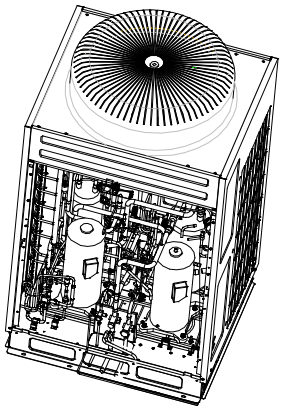
4 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

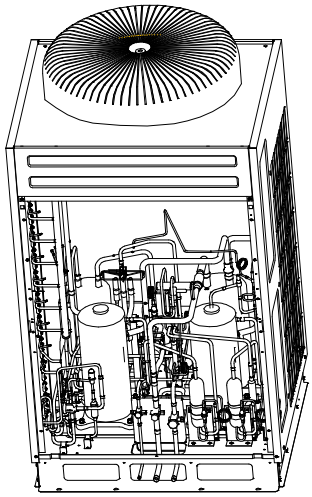
4.1Outdoor Unit

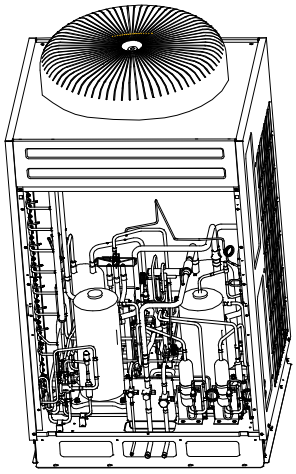
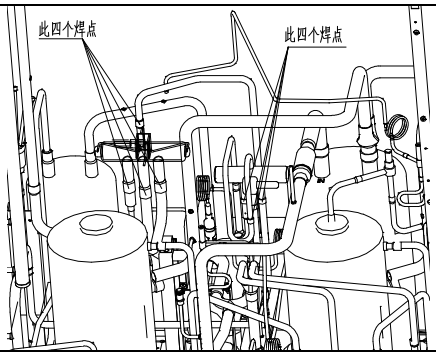
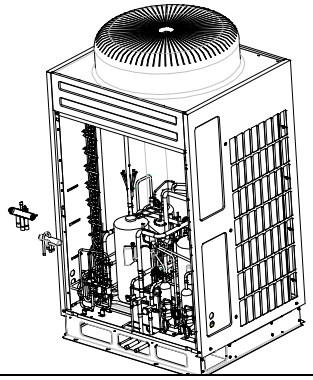
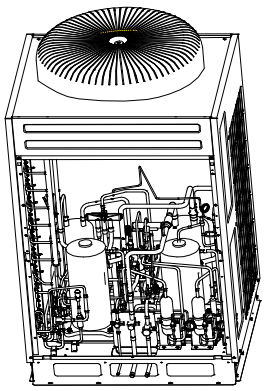
Disassembly and Assembly of external casing		
Remark :		
Step	Illustration	Handling Instruction
1. Remove the front panel		①Use screwdriver to remove the screws; ②Raise upward and remove the front panel.
2. Remove the electric box cover		① Use screwdriver to remove the screws; ② Remove the electric box cover
3. Remove the electric box		①Unplug the power cords and communication lines from the mainboard; ②Use screwdriver to remove the screws; ③ Remove the electric box

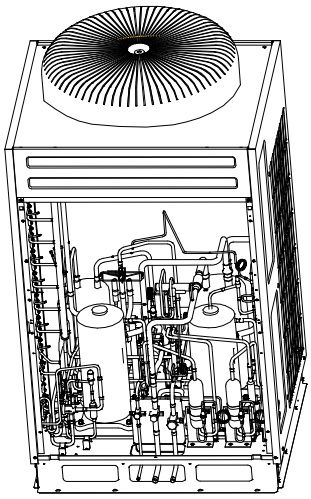
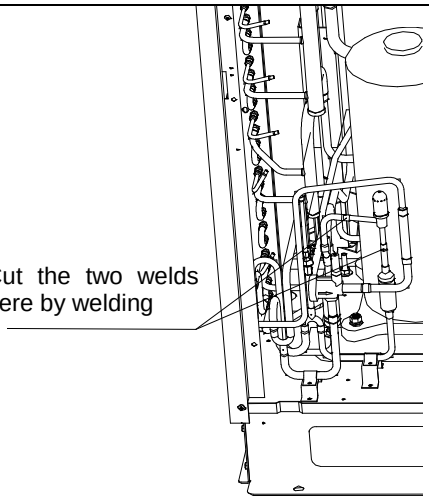
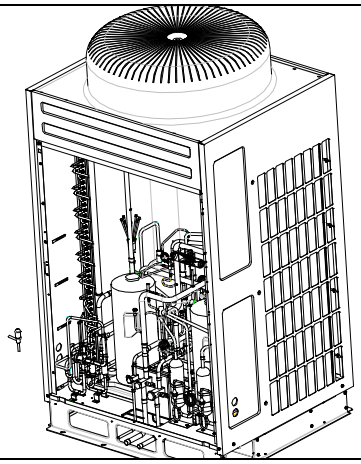
4. Remove the flow-guide cover		①Use screwdriver to remove the screws; ②Remove the flow-guide cover
5. Remove the fan sub-assembly		①Use screwdriver to remove the screws; ②Remove the fan sub-assembly
6. Remove the front panel 1 and front lining plate sub-assembly		①Use screwdriver to remove the screws; ②Remove the front panel 1 ③Use screwdriver to remove the screws; ④Remove the front lining plate sub-assembly
7 Remove the left side plate, right side plate, rear lining plate sub-assembly and back cover board		①Use screwdriver to remove the screws fixing the left side plate and right side plate; ②Remove the left side plate and right side plate ③Use screwdriver to remove the screws fixing the rear lining plate sub-assembly and back cover board; ④Remove the rear lining plate sub-assembly and back cover board

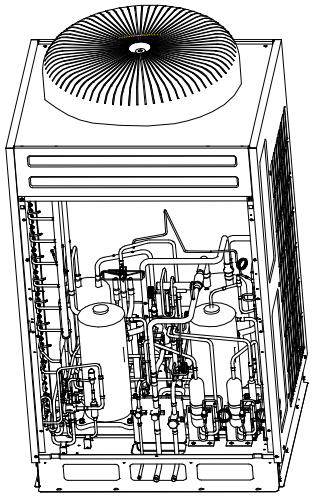
8. Assemble the unit in reverse procedures		●Assemble the unit in reverse to the disassembly procedures and energize it for testing.

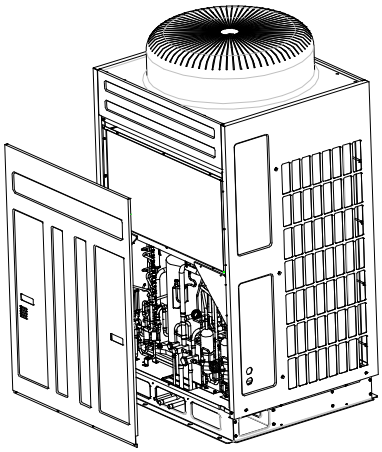
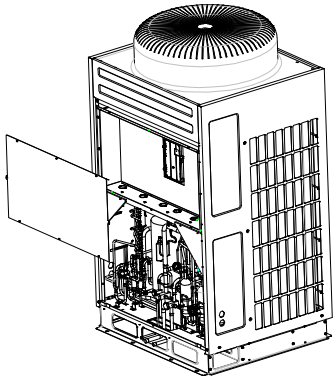
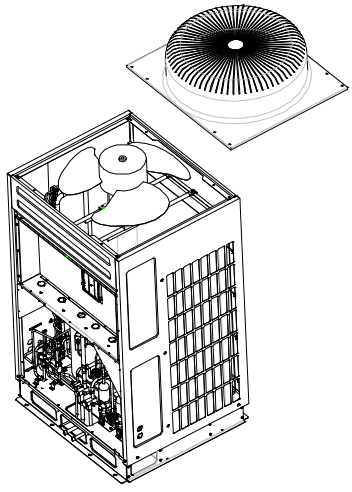
Removal and Installation of Compressor		
Remark: Before removing the compressor, make sure that there is no refrigerant inside the pipe system and that the power has been cut off.		
Step	Illustration	Handling Instruction
1. Remove the power cord		①Use screwdriver to loosen the screws fixing the power cable. ② Pull out the power cable. Note: When removing the power cable, please mark the power cable color and corresponding terminal, thus to avoid error during reinstallation.
2. Remove the oil separator, oil separator support and pipe in front of the compressor		①Disconnect the pipeline from the compressor and oil separator. ②Use screwdriver to remove the screws fixing the oil separator support ③ Remove the oil separator, oil separator support and related pipes
3. Remove the compressor from chassis		①. Use tool to remove the bolts fixing the compressor ②Remove the compressor from chassis
4. Fix the new compressor to chassis		①. Install the compressor correctly to the chassis sub-assembly. ②Tighten the nuts with tool.

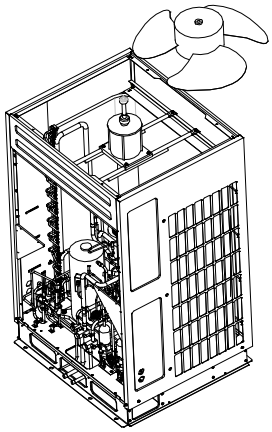
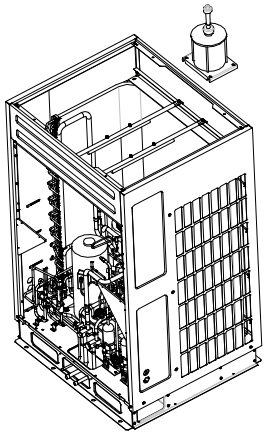
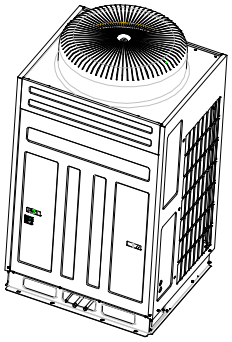
5. Connect the suction and exhaust pipe of compressor to system pipeline		①. Weld pipeline connected to the compressor (including the exhaust pipe, suction pipe, oil balance pipe and gas balance pipe).
6. Connect the power cables of compressor correctly		
7. Reinstall the electric heater and exhaust sensor of the compressor.		
8. Check if the compressor rotates in correct direction if the lubricating oil is leaked.		

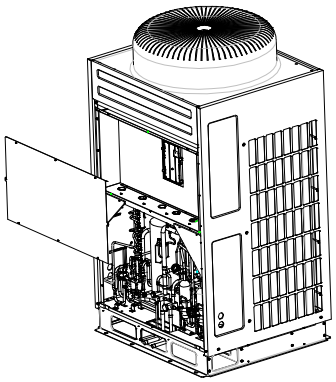
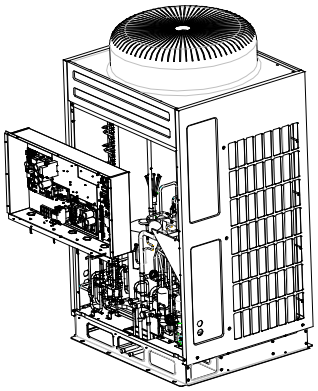
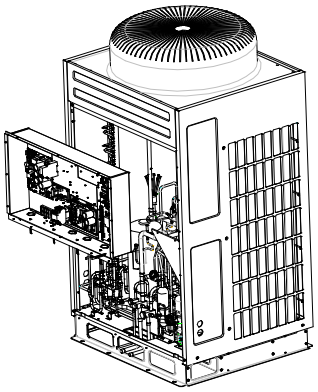
Disassembly and Assembly of 4-way valve		
Step	Illustration	Handling Instruction
1. Remove the coil of 4-way valve		①Use screwdriver to remove the screws fixing the coil ②Remove the coil of 4-way valve.
2. Use welding gun to cut the four pipes connected to 4-way valve.		①. Use welding gun to cut the pipes connected to 4-way valve (weld spot indicated in the figure)
3. Remove the 4-way valve		①. Remove the 4-way valve
4. Replace the 4-way valve		①Put the new 4-way valve to correct position
5. Reinstall the pipes connected to 4-way valve.		①. Reweld the pipes connected to 4-way valve
6. Install the coil of 4-way valve		①. Place the coil of 4-way valve correctly. ②Tighten the screws with screwdriver.

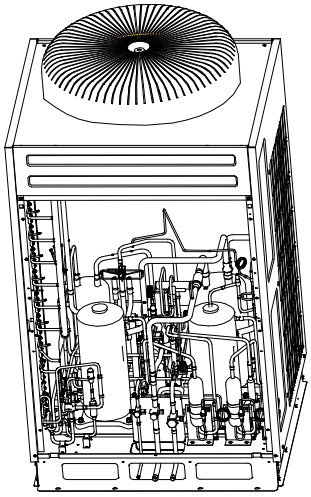
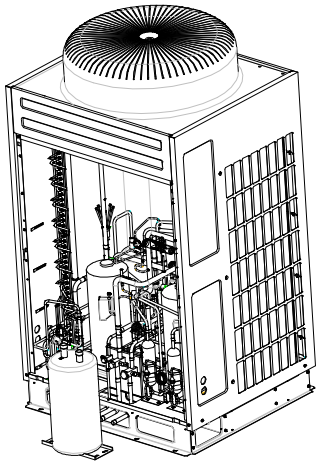
Removal and Installation of Electronic Expansion Valve		
Remark :		
Step	Illustration	Handling Instruction
1. Remove the coil of electronic expansion valve		①Rotate the coil of electronic expansion valve and remove it after loosening the clamp.
2. Use welding gun to cut the pipes connected to electronic expansion valve		①. Use welding gun to cut the pipes connected to electronic expansion valve
3. Replace the electronic expansion valve.		①Put the new electronic expansion valve to correct position

4. Reinstall the pipes connected to electronic expansion valve.		①. Reweld the pipes connected to electronic expansion valve
5. Install the coil of electronic expansion valve		①. Mount the coil of electronic expansion valve onto valve body and align the clamp.

Removal and Assembly of Fan		
Remark :		
Step	Illustration	Handling Instruction
1. Remove the front panel		①Use screwdriver to remove the screws; ②Remove the front panel;
2. Remove the electric box cover		①Use screwdriver to remove the screws; ②Remove the electric box cover
3. Remove the power cord of fan		①Unplug the power cord of fan from mainboard; ②Remove the power cord from the strap and cable hook
4. Remove the flow-guide cover		①Use screwdriver to remove the screws; ②Remove the flow-guide cover

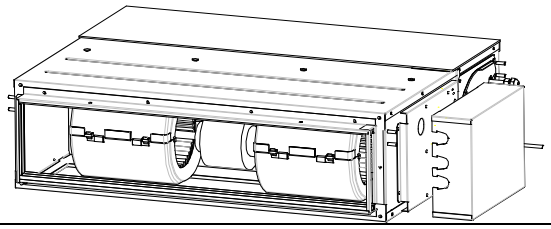
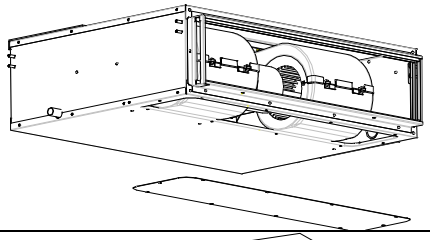
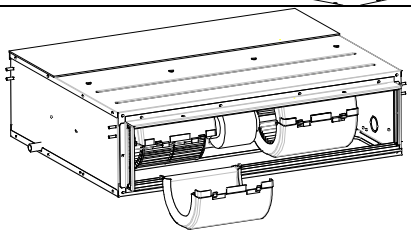
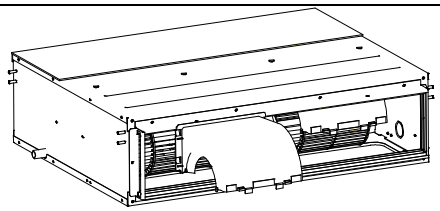
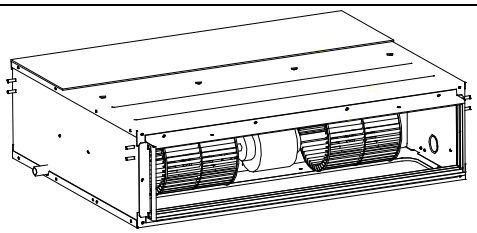
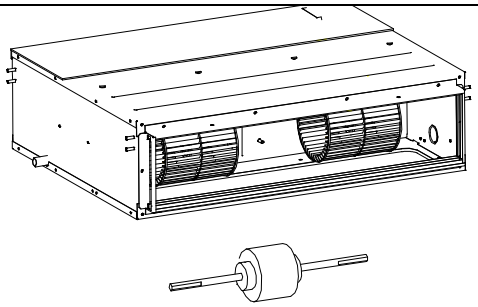
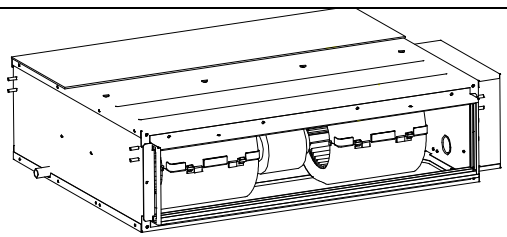
5. Remove the axial flow fan		①Remove the lower nuts; ②Remove the axial flow fan
6. Remove the motor		①Use screwdriver and spanner to remove the lower bolts; ②Remove the motor
7. Replace the motor and reassemble the unit.		①Assemble the unit in reverse to the disassembly procedures and energize it for testing.

Removal and Installation of Electric Box		
Remark :		
Step	Illustration	Handling Instruction
1. Remove the electric box cover		①Use screwdriver to remove the screws; ②Remove the electric box cover
2. Remove the electric box		①Unplug the power cords and communication lines from the mainboard; ②Use screwdriver to remove the screws; ③ Remove the electric box
3. Assemble in reverse to the disassembly procedures.		①Assemble the unit in reverse to the disassembly procedures and energize it for testing.

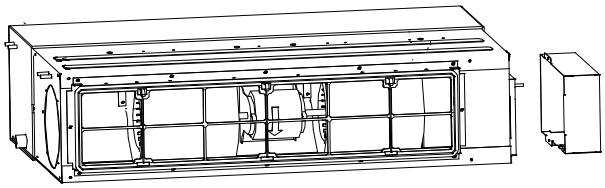
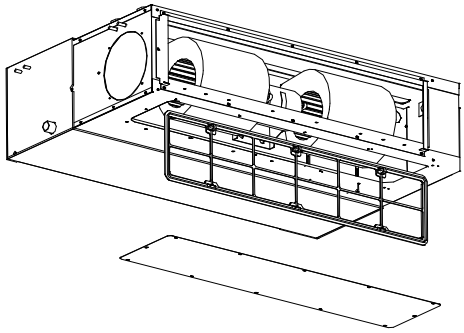
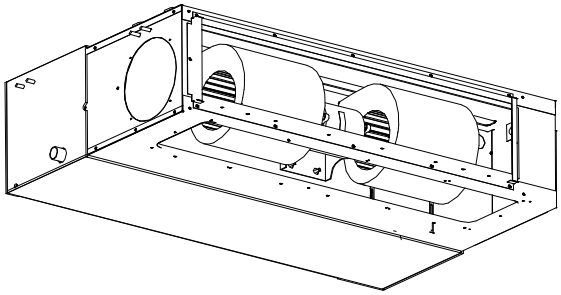
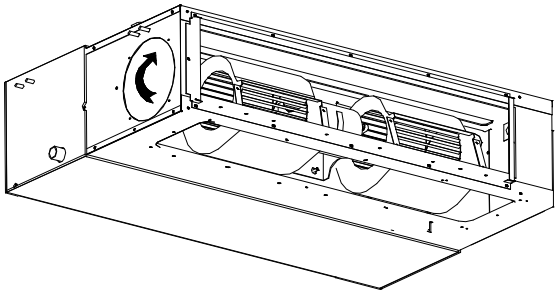
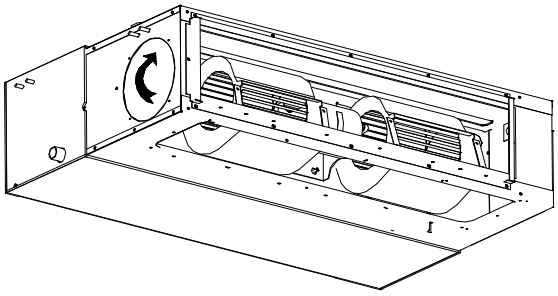
Removal and Installation of Gas-Liquid Separator		
Remark :		
Step	Illustration	Handling Instruction
1. Disconnect the pipes connected to the gas-liquid separator		①. Disconnect the pipes connected to the gas-liquid separator
2. Remove the gas-liquid separator from the chassis		①. Use tool to remove the bolts fixing the gas-liquid separator ②Remove the gas-liquid separator from the chassis
3. Fix the new gas-liquid separator onto chassis		①. Install the gas-liquid separator correctly to chassis sub-assembly. ②Tighten the bolts with tool.

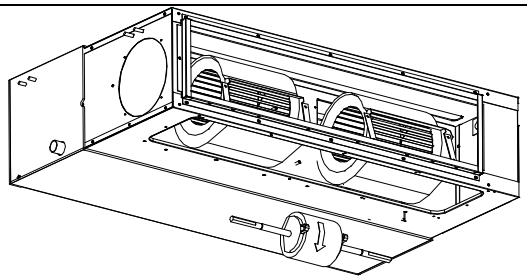
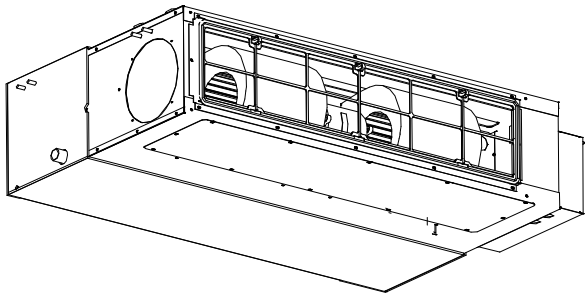
4.2 Indoor Unit

1） Common Duct-type Unit

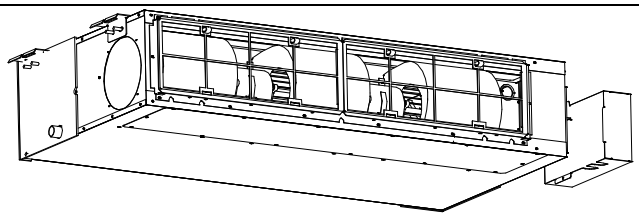
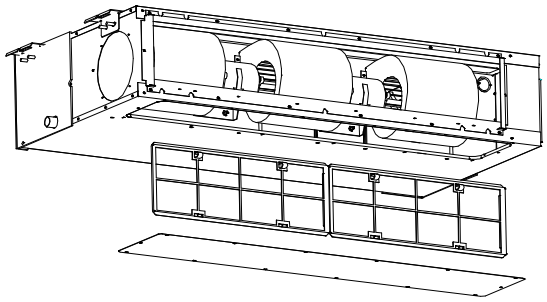
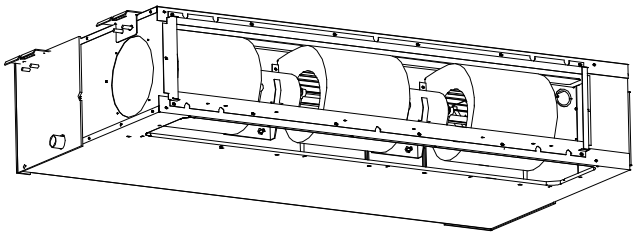
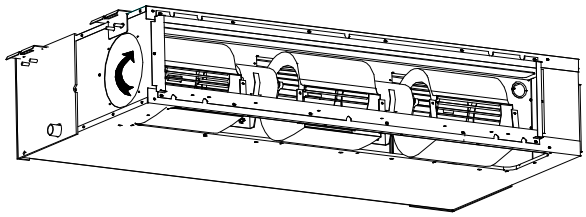
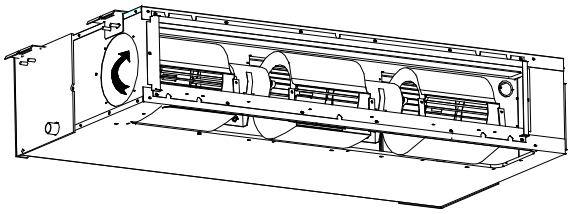
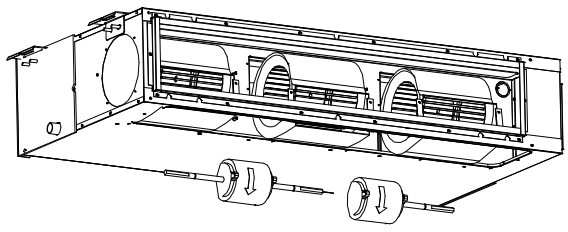
Removal and Assembly of Fan Motor		
Remarks: Before removing the fan, make sure to cut off the power firstly.		
Step	Illustration	Handling Instruction
1. Unplug the motor cables		●Cut off the power supply of indoor unit. Use screwdriver to remove the electric box cover and unplug the motor cables in electric box.
2. Remove the air inlet cover board		●Use screwdriver to remove the lower air inlet cover board
3. Remove the back propeller housing		●Loosen the clamp between back propeller housing and front propeller housing. Remove the back propeller housing
4. Remove the front propeller housing		●Use screwdriver to loosen the screws fixing the front propeller housing. Remove the front propeller housing.
5. Loosen the fan and motor.		●Use inner hexagonal spanner to loosen the screws on fan and remove the clamp fixing the motor.
6. Remove the motor		●Firstly, disengage the motor from motor support and then disengage the fan from the motor. Then, remove the motor from the lower air inlet frame. In which, for the motor with automatic motor support, the motor support shall be removed in advance and then changed to the unit.
7. Replace with a new motor		●Assemble the unit in reverse to the disassembly procedures and energize it for testing.

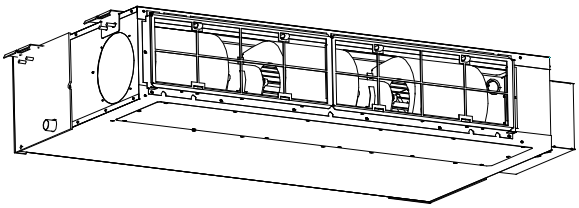
- Duct-Type Unit（5.6 kW～8.0 kW）

Removal and Assembly of Fan Motor		
Remarks: Before removing the fan, make sure to cut off the power firstly.		
Step	Illustration	Handling Instruction
1. Unplug the motor cables		●Cut off the power supply of indoor unit. Use screwdriver to remove the electric box cover and unplug the motor cables in electric box.
2. Remove the filter sub-assembly and air inlet cover board		●Remove the filter sub-assembly from the air inlet frame and use screwdriver to remove the air inlet cover board.。
3. Remove the screws on fan sub-assembly.		●Remove the screws on fan sub-assembly.
4. Overturn the propeller housing		●Rotate the propeller housing to the air inlet opening according to arrow direction.
5. Loosen the fan and motor.		●Use inner hexagonal spanner to loosen the screws on fan and remove the clamp fixing the motor.

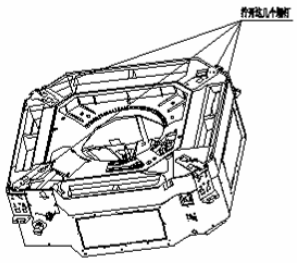
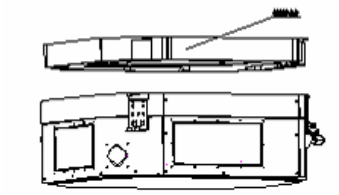
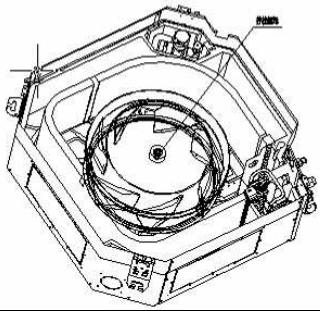
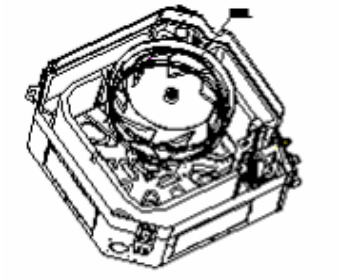
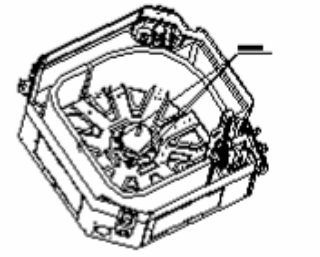
6. Replace the motor		●Firstly, disengage the motor from motor support. Then, sequentially disengage the fan sub-assembly form the motor shaft. Remove the motor from the air inlet and replace with new motor. In which, for the motor with automatic motor support, the motor support shall be removed in advance and then changed to the unit.
7. Assemble the unit in reverse to the disassembly procedures		●Assemble the unit in reverse to the disassembly procedures and energize it for testing.

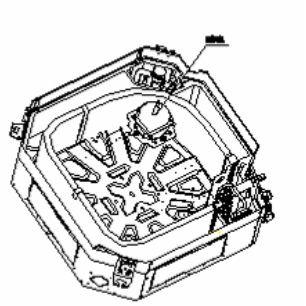
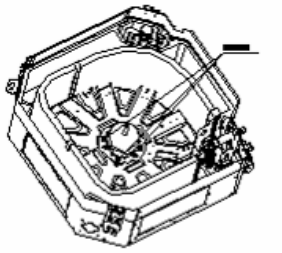
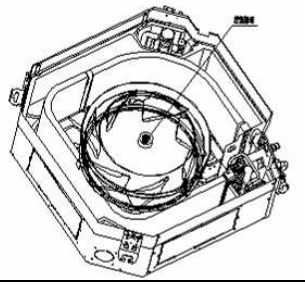
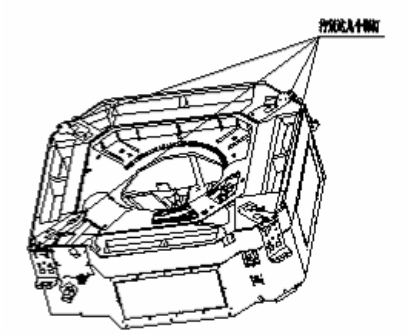
- Duct-Type Unit（9.0 kW～14 kW）

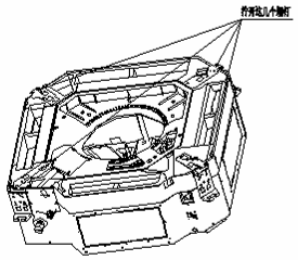
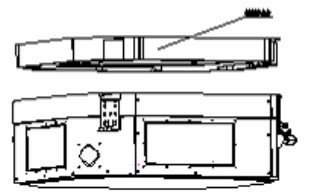
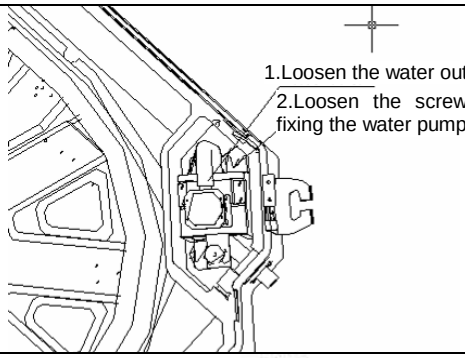
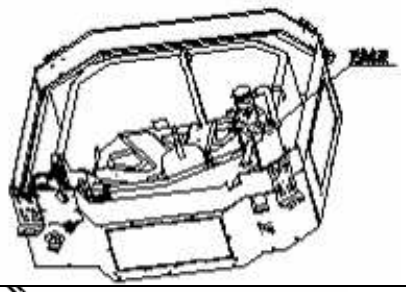
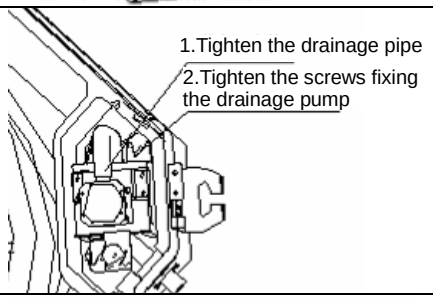
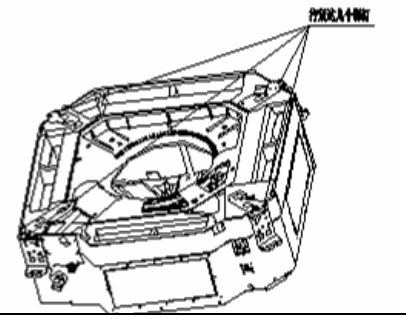
Removal and Assembly of Fan Motor		
Remarks: Before removing the fan, make sure to cut off the power firstly.		
Step	Illustration	Handling Instruction
1. Unplug the motor cables		●Cut off the power supply of indoor unit. Use screwdriver to remove the electric box cover and unplug the motor cables in electric box.
2. Remove the filter sub-assembly and air inlet cover board		●Remove the filter sub-assembly from the air inlet frame and use screwdriver to remove the air inlet cover board.。
3. Remove the screws on fan sub-assembly.		●Remove the screws on fan sub-assembly.
4. Overturn the propeller housing		●Rotate the propeller housing to the air inlet opening according to arrow direction.
5. Loosen the fan and motor.		●Use inner hexagonal spanner to loosen the screws on fan and remove the clamp fixing the motor.
6. Replace the motor		●Firstly, disengage the motor from motor support. Then, sequentially disengage the fan sub-assembly form the motor shaft. Remove the motor from the air inlet and replace with new motor. In which, for the motor with automatic motor support, the motor support shall be removed in advance and then changed to the unit.

7. Assemble the unit in reverse to the disassembly procedures		●Assemble the unit in reverse to the disassembly procedures and energize it for testing.

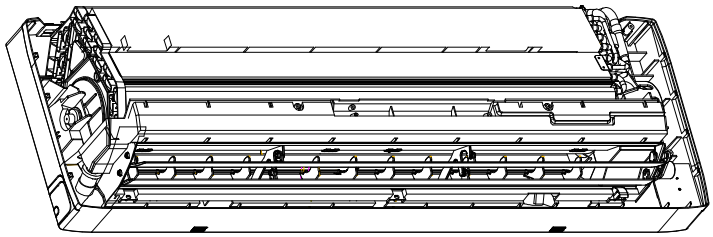
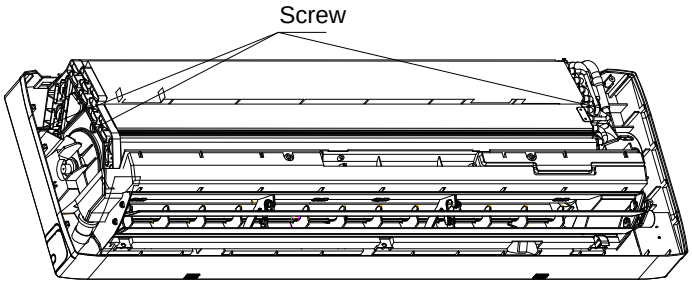
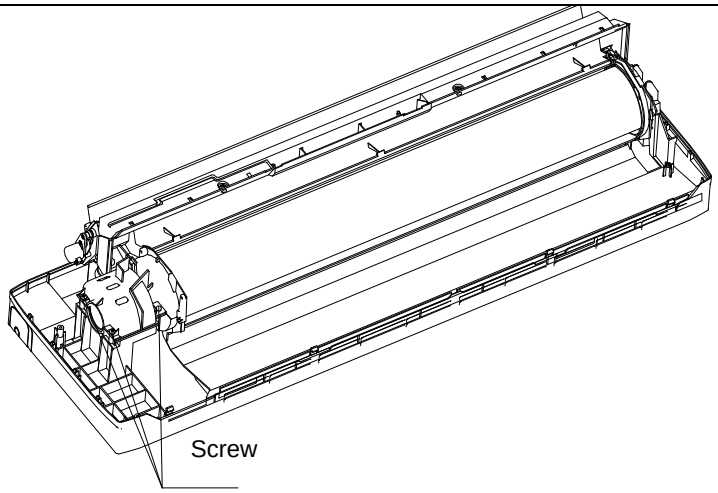
2） Cassette-type Unit

Removal and Assembly of Fan Motor		
Step	Illustration	Handling Instruction
1. Loosen the screws fixing the water tray		●Use screwdriver to loosen the screws fixing the water tray
2. Remove the water tray		●Remove the water tray
3. Loosen the bolts fixing the fan		●Use spanner to loosen the bolts fixing the fan.
4. Remove the fan		●Remove the fan
5. Loosen the screws fixing the motor		●Use screwdriver to loosen the screws fixing the motor

6. Remove the motor and replace it		●Remove the motor and replace it
7. Tighten the screws fixing the motor		●Use screwdriver to tighten the screws fixing the motor.
8. Mount the fan and tighten the fixing bolts		●Mount the fan and use spanner to tighten the bolts fixing the fan
9. Mount the water tray and tighten the screws		●Use screwdriver to loosen the screws fixing the water tray

Removal and Installation of Drainage Pump		
Step	Illustration	Handling Instruction
1. Loosen the screws fixing the water tray		●Use screwdriver to loosen the screws fixing the water tray
2. Remove the water tray		●Remove the water pump and replace it.
3. Pull out the water outlet pipe and loosen the screws fixing the water pump.		●Pull out the water outlet pipe and use screwdriver to loosen the screws fixing the water pump.
4.Remove the water pump and replace it.		●Remove the water pump and replace it.
5. Connect the drainage pipe and tighten the screws fixing the water pump.		●Connect the drainage pipe and use screwdriver to tighten the screws fixing the water pump.
6. Mount the water tray and tighten the screws		●Use screwdriver to tighten the screws fixing the water tray

3) Wall-mounted type

Removal and Assembly of Fan Motor		
Remark:Before removing the compressor, make sure that there is no refrigerant inside the pipe system and that the power has been cut off.		
Step	Illustration	Handling Instruction
1. Firstly, remove the front panel, front case and electric box		●Firstly, use screwdriver to loosen the screws. ●Unplug the motor terminals in the electric box. Loosen the earth screws and lift up.
2. Remove the evaporator		●Firstly, use screwdriver to remove the fixing screws on the left and right side. Then, remove the evaporator.
3. Remove the motor and cross flow fan		●Use screwdriver to remove the screws fixing the motor clamp and remove the screws connecting the motor and cross flow fan. Then, the motor can be separated from the cross flow fan.

4) Floor ceiling type

Removal and Assembly of Fan Motor		
Remark:		
Step	Illustration	Handling Instruction

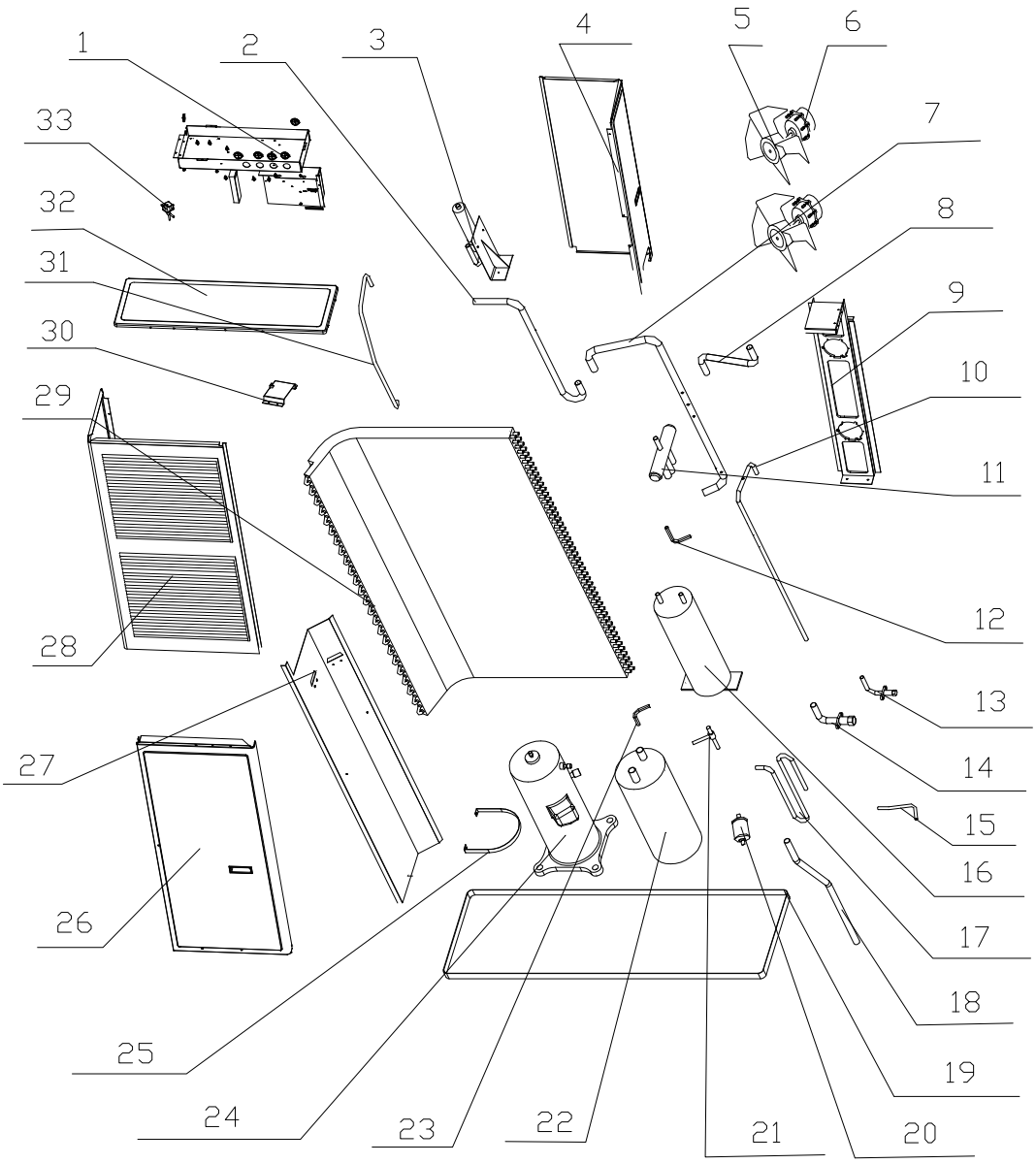
Removal and Assembly of Mainboard		
Remark:		
Step	Illustration	Handling Instruction

Removal and Assembly of Swing Motor		
Remark:		
Step	Illustration	Handling Instruction

5 EXPLODED VIEWS AND PART LIST

5.1 Outdoor Unit

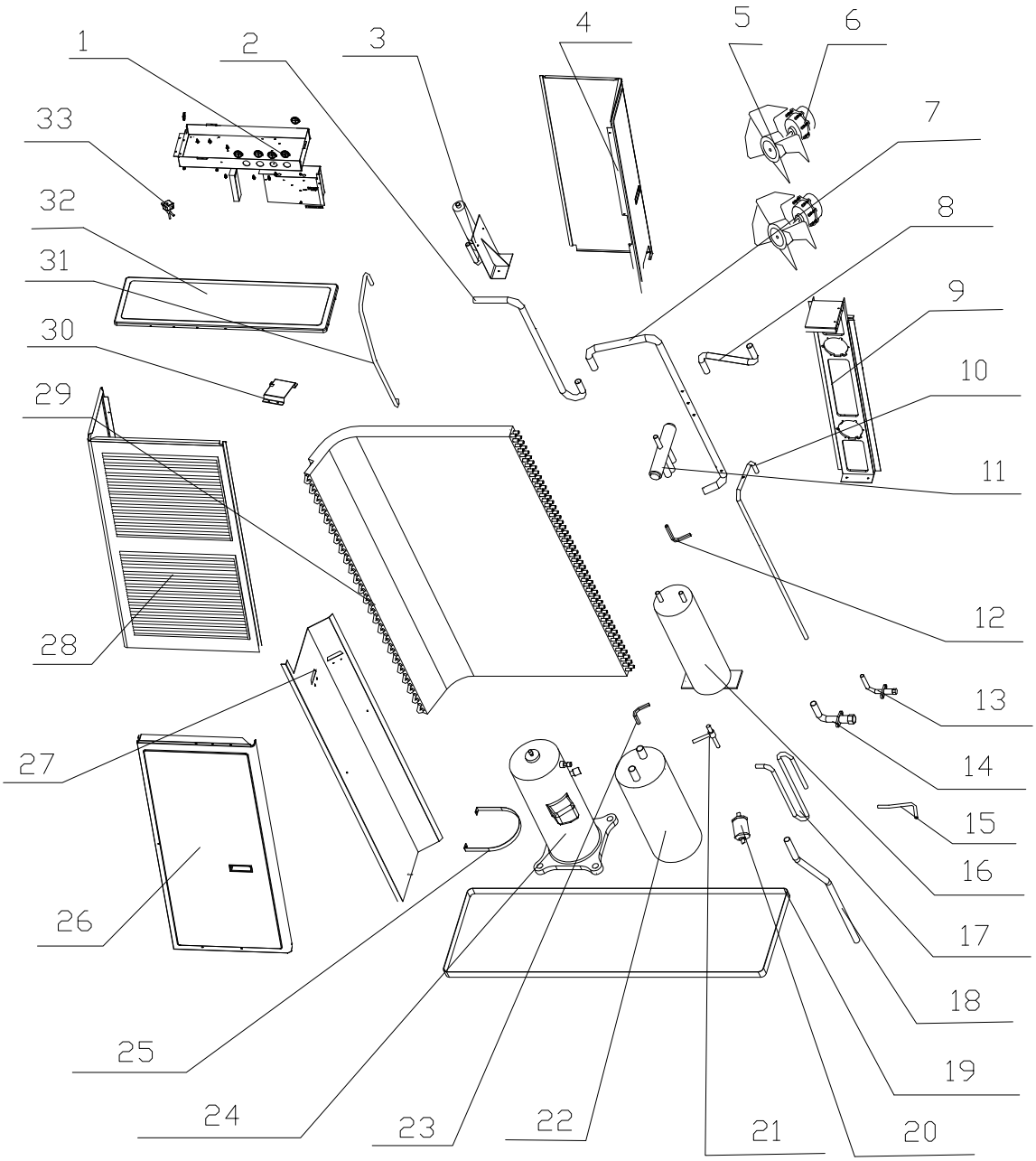
GMV(L)-R120W/Na-K


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33

List of components

GMV(L)-R160W/Na-M

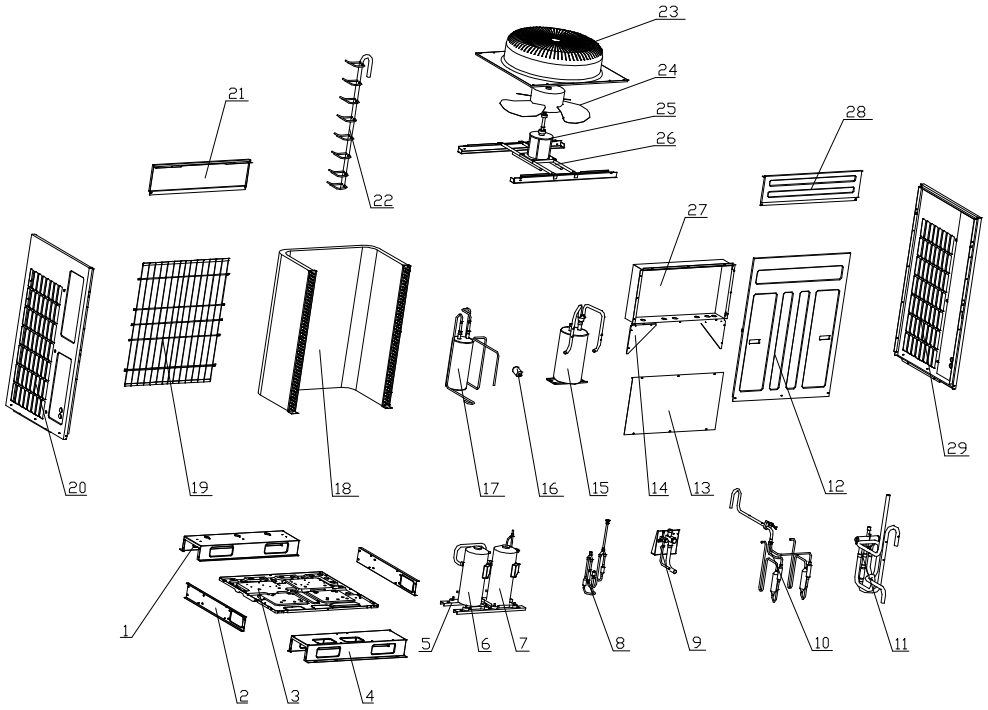
No.	Part name	Quanti ty	Drawing no.	Material code	Remark
1	Electric Box	1	VR120WNaK.01000000	01394331	
2	Gas-liquid separate connect pipe	1	VR100WA.09010003	05014617	
3	Oil separator Assy	1	VR100WA.08020000(01)	072287771	
4	panel rear	1	VP14WA.07000001	01308736	
5	Axial fan	2	LF7.5WB.00000003	10335253	
6	Motor	2	KFR140WlE.03010002(01)	150154511	
7	Suction pipe	1	VR120WA.08010003	03628805	
8	Condenser connect-pipe	1	VR100WNE.09010001	05024613	
9	motor support	1	VP14WA.03010003	01708733	
10	discharge pipe 2	1	VR100WA.09010001	03818797	
11	4-Way Vavle	1	TY.00.374a	43000338	
12	Out-pipe of uninstall vavle	1	VR100WA.02010002	03234632	
13	Liquid Valve Assy	1	TY.00.304b	07130209	
14	Gas Valve Assy	1	KFR60WNaA11E.01000001	07103030	
15	Exit Tube of condenser	1	VR160WNaM.18010001	03338806	
16	High pressure liquid tank	1	VP14WA.16000000	07228735	
17	Discharge pipe 1	1	VR120WA.08010001	03618769	
18	Gas Valve connect pipe	1	VR120WNaK.05028829	05028829	
19	Chassis	1	VP14WA.01000001	01218731	
20	Dry Filter	1	VR160WNaM.00000002	07218769	
21	PWM valve	1			Component of compressor
22	liquid-gas separator	1	VR100WA.17000001	07228767	
23	In-pipe of uninstall vavle	1	VR120WA.02010001	03234649	
24	Compressor	1	00100395	00100395	
25	Gas-disparting set clamp	1	VR100WA.04000002	02148768	
26	panel front	1	VP14WA.06000001	01308733	
27	mid．isolation sheet	1	VR100WA.04000001	01238763	
28	Front Plate	1	KFR120WlB.00000001	01435433	
29	Condensing Assy	1	VR100WNE.18010000	01138782	
30	Support	1	VRe150WS.01010003	01724601	
31	Exit Tube of Dry Filter	1	VR160WNaM.19010002	03338808	
32	Top plate	1	VP14WA.12000001	01258731	
33	Electric expand vavle	1	VPd260WNaM.03020001	07130364	


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33

List of components

GMV（L）-R260W2/Na-M, GMV(L)-R300W2/Na-M

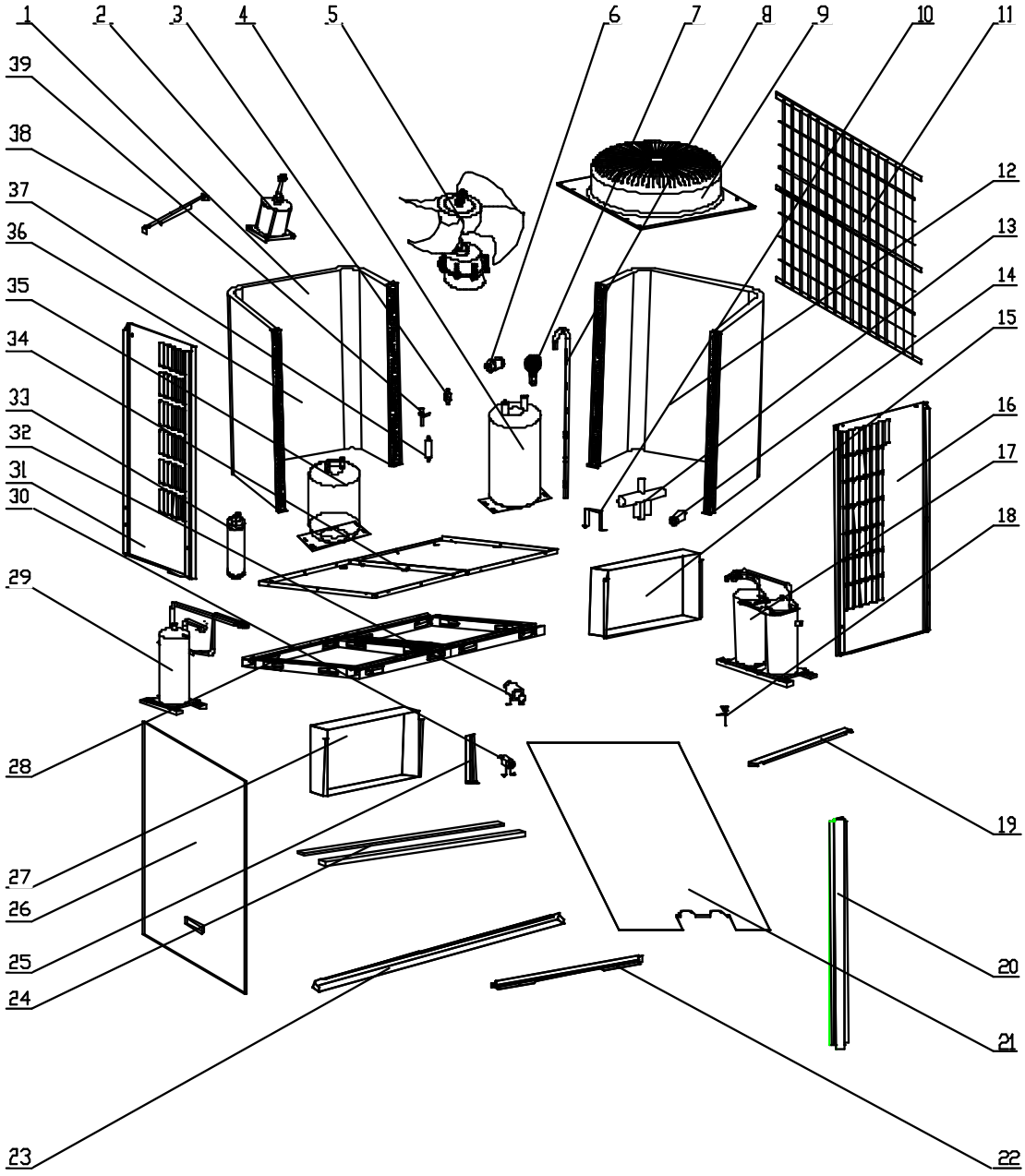
No.	Part name	Quantity	Drawing no.	Material code	Remark
1	Electric Box	1	VR160WNaM.01000000	01394603	
2	Gas-liquid separate connect pipe	1	VR100WA.09010003	05014617	
3	Oil separator Assy	1	VR100WA.08020000(01)	072287771	
4	panel rear	1	VP14WA.07000001	01308736	
5	Axial fan	2	LF7.5WB.00000003	10335253	
6	Motor	2	KFR140WlE.03010002(01)	150154511	
7	Suction pipe	1	VR120WA.08010003	03628805	
8	Condenser connect-pipe	1	VR140WA.09010002	05014622	
9	motor support	1	VP14WA.03010003	01708733	
10	discharge pipe 2	1	VR100WA.09010001	03818797	
11	4-Way Vavle (Only for heat pump)	1	TY.00.374a	43000338	
12	Out-pipe of uninstall vavle	1	VR100WA.02010002	03234632	
13	Liquid Valve Assy	1	TY.00.304b	07130209	
14	Gas Valve Assy	1	TY.01.111d	07130212	
15	Exit Tube of condenser	1	VR160WNaM.18010001	03338806	
16	High pressure liquid tank	1	VP14WA.16000000	07228735	
17	Discharge pipe 1	1	VR120WA.08010001	03618769	
18	Gas Valve connect pipe	1	VR100WA.09010004	05014618	
19	Chassis	1	VP14WA.01000001	01218731	
20	Dry Filter	1	VR160WNaM.00000002	07218769	
21	PWM valve	1			Component of compressor
22	liquid-gas separator	1	VR100WA.17000001	07228767	
23	In-pipe of uninstall vavle	1	VR120WA.02010001	03234649	
24	Compressor	1	00100533	00100533	
25	Gas-disparting set clamp	1	VR100WA.04000002	02148768	
26	panel front	1	VP14WA.06000001	01308733	
27	mid. isolation sheet	1	VR100WA.04000001	01238763	
28	Front Plate	1	KFR120WlB.00000001	01435433	
29	Condensing Assy	1	VR160WNaM.18010000	01138786	
30	Support	1	VRe150WS.01010003	01724601	
31	Exit Tube of Dry Filter	1	VR160WNaM.19010002	03338808	
32	Top plate	1	VP14WA.12000001	01258731	
33	Electric expand vavle	1	VR100WNaK.03020001	07138801	


23
24
25
26
21
22
28
27
29
20
19
18
17
16
15
14
13
12
1
2
3
4
5
6
7
8
9
10
11

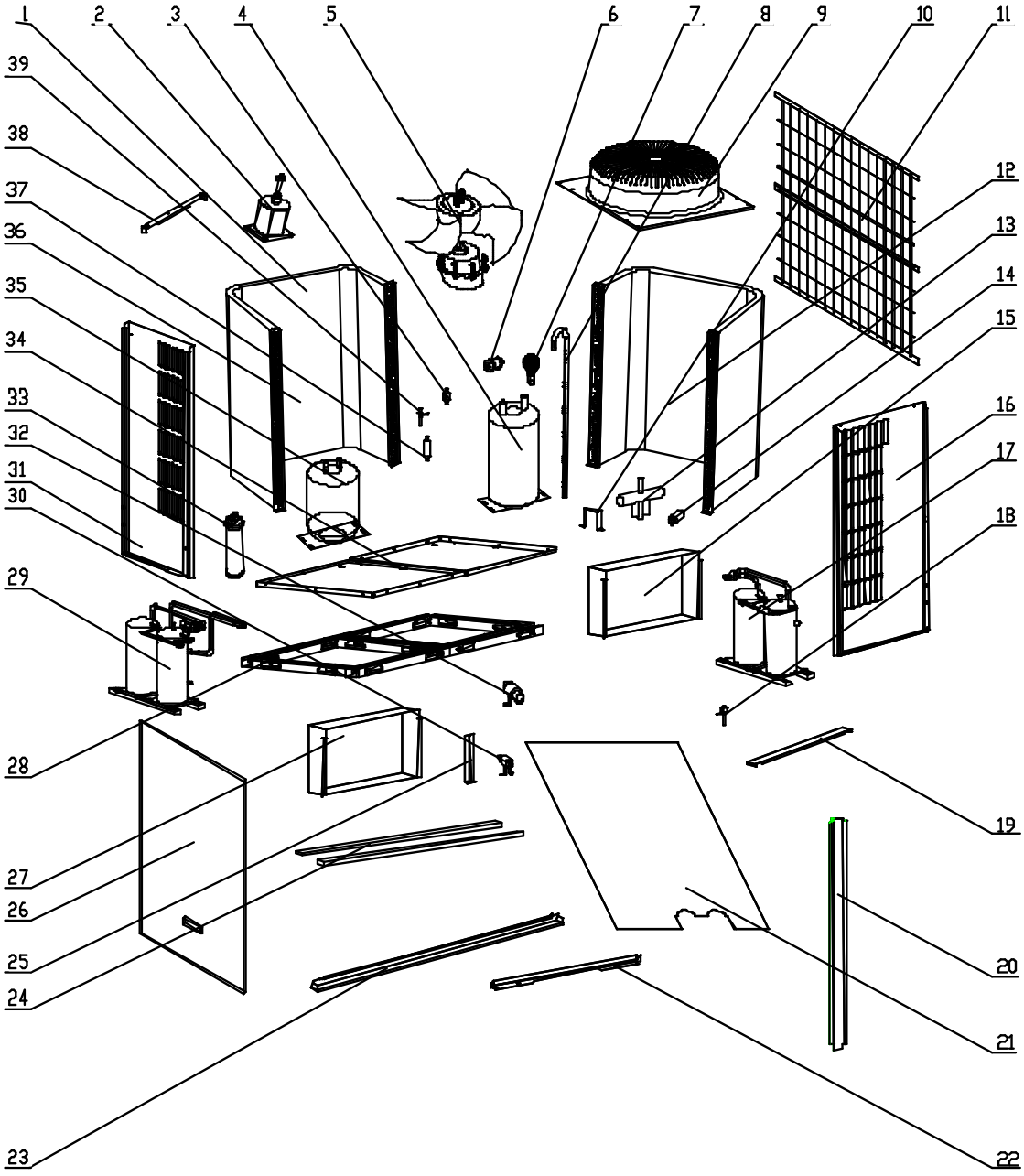
GMV（L）-R260W2/Na-M, GMV(L)-R300W2/Na-M List of Componet

No.	Part name	Quantity	Drawing no.	Material code	Remarks
1	Beam of base sub-assy2	1	VRm300WD.01010200	01874618	
2	Carling of base sub-assy	2	VP300W2D.01010003	01778737	
3	Underpan Sub-Assy	1	VRm300WD.01020000	01284602	
4	Beam of base sub-assy1	1	VRm300WD.01010100	01874620	
5	Welded installation girder of compressors	2	VR30W2.03010000	01338778	
6	Compressor and its component ZPD72KCE-TFD-433	1	00100534	00100534	
7	Compressor and its component ZP67KCE-TFD-420	1	00100532	00100532	
8	Electric expansion valve component	1	VR260W2NaM.07138834	07138834	
9	bracket1	1	VRm300WD.01030001	01804601	
10	Component of vent-pipe	1	VRm300WD.03050000(01)	4300460301	
11	4-way valve sub-assy (Only for heat pump)	1	VR260W2NaM.04144603	04144603	
12	Front plate sub-assy	1	VP300W2D.05010001	01538734	
13	Cover of electric box	1	VPd280W.06020001	01414309	
14	Triangle support	2	VPd280W.03010005	01794701	
15	Gas-liquid separator	1	VR20W2.05000006	07228768	
16	Bi-flow filter drier	1	VR160WNaM.00000002	07218769	
17	Double direction liquid accumlator	1	VR30W2.05000010	07228765	
18	Condenser sub-assy	1	VR300W2NaM.08010000	01138785	
19	Rear isolation sheet	1	VPd280W.03030001	01238740	
20	Left side plate sub-assy	1	VP280W2D.01314301P	01314301P	
21	Rear cover plate	1	VPd280W.03010002	01258737	
22	Collect Gas Pipe Sub-assy	1	VR300W2BF.05024691	05024691	
23	Stream lined dome	1	RF28WO.00000001	22265801	
24	Fan	1	RF28WO.00000015	10355801	
25	Motor	1	VR300W2B.03000001	15704601	
26	Motor fix support	2	RF28WO.09000001	01335801	
27	Electric box sub-assy	1	VR300W2BH.01394671P	01394671P	
27	Front plate	1	VP300W2D.04010001	01538736	
29	Right side plate	1	VP300W2D.03010001	01318759	

GMV（L）-R450W3/Na-M



GMV（L）-R560W4/Na-M , GMV（L）-R620W4/Na-M

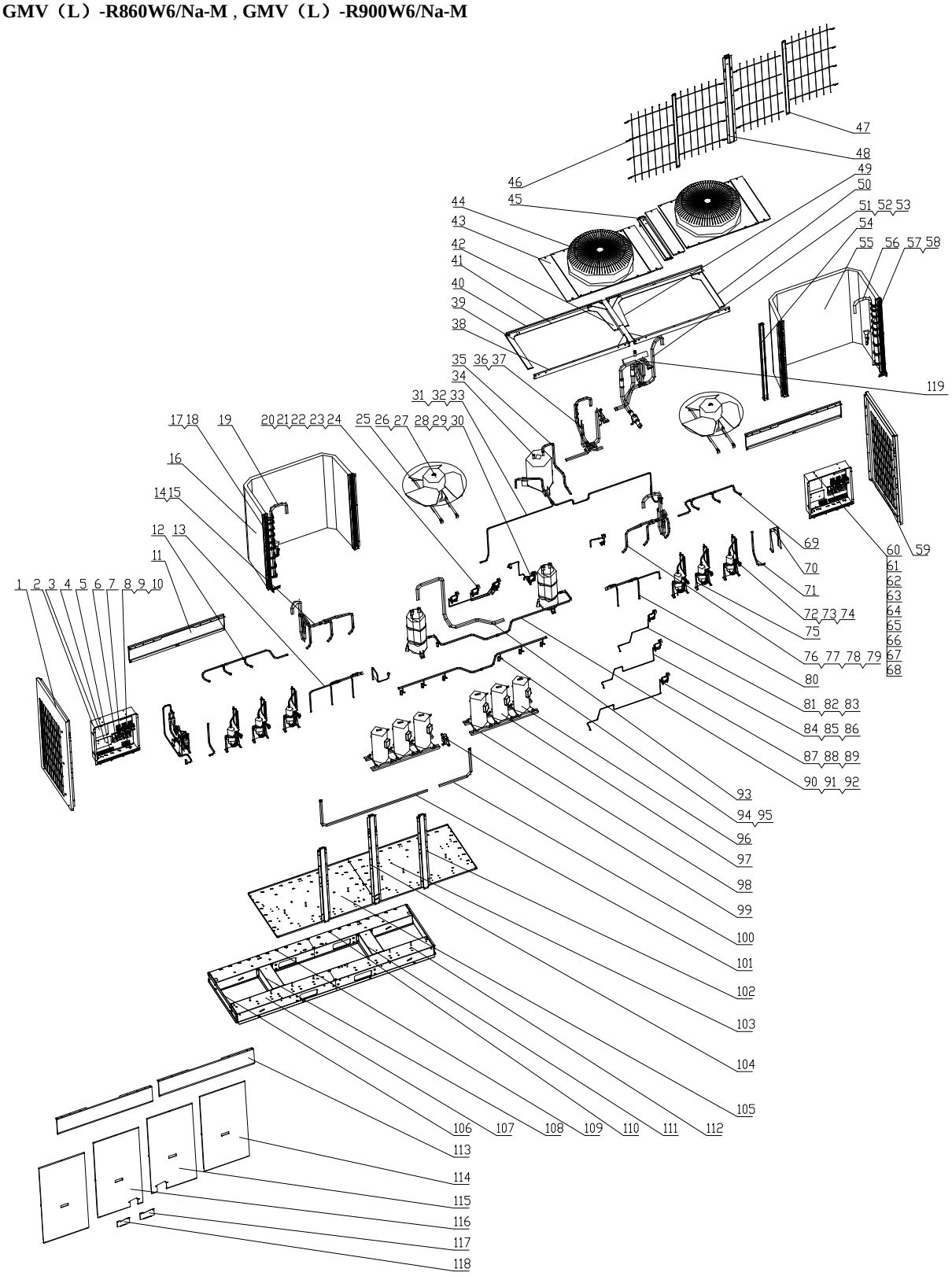


List of components

No.	Part name	Quantity	Drawing no.	Material code	Remark
1	condensor component（Left）	1	VR600W4Na.04010000	1154605	
2	Motor	2	VR300W2B.03000001	15704601	
3	Filter	2	TY.01.56	7210032	
4	Gas-liquid Separator	1	VR600W4A.03000102	7228781	
5	Fan	2	RF28WO.00000015	10355801	
6	Dry Filter	1	VR160WNaM.00000002	7218769	
7	Saparator	2	TY.01.91(01)	72200081	
8	Discharge Pipe	2	VR600W4Na.04020001	4654632	
9	Stream lined dome	2	RF28WO.00000001	22265801	
10	Bracket (filter)	2	VR600W4A.09020006	1728795	
11	Rear isolation sheet	2	VPd280W.03030001	1238740	
12	condensor component（Right）	1	VR600W4Na.05010000	1154606	
13	Four-way valve	1	TY.43000412	43000412	
14	Filter	1	FGR35(O).06000010	7218603	
15	Electric Box 1	1	VLR600W4A.30010001	1418788	
16	Right Side Plate	1	VLR600W4A.20000004	1308775	
17	components of compressor（right）	1	VR600W4Na.10000000	234602	
18	electromagnetic valve	6	43000054	43000054	
19	Support Shelf 2	2	VLR600W4A.20000011	1798775	
20	Support Shelf 3	1	VLR600W4A.20080013	1798779	
21	Panel 2 (front)	1	VLR600W4A.20000009	1538804	
22	Support Shelf 4	2	VLR600W4A.20080013	1798779	
23	Support Shelf 1	1	VLR600W4A.20000005	1798773	
24	Install Girder by Joint	1	VR600W4A.02000400	1338739	
25	Welding for Support	2	VR600W4A.09020100	1728802	
26	panel1 (front)	1	VLR600W4A.20000008	1538802	
27	Electric Box Components1	1	VR600W4Na.40000000	1394684	
28	Base	1	VR620W4A.01000000	1208802	
29	Components of compressor（left）	1	VR600W4Na.11000000	234603	
30	Liquid Valve Assy 5/8	1	TY.07130128	7130128	
31	Left Side Plate	1	VLR600W4A.20000003	1308773	
32	Liquid Valve Assy 1-1/8	1	VR300W2NaM.00000001	7138799	
33	Oil Separator	3	VP125W2J.00000008	7228742	
34	Underpan	1	VLR600W4A.20010000	1208784	
35	Bidirection Accumulator	1	VR600W4A.03000103	7228780	
36	condensor component（Left）	1	VR600W4Na.04010000	1154605	
37	One-way Valve	2	VJ260W2NaM.00000008	4324001	

38	Motor fix support	4	RF28WO.09000001	1335801	
39	Electric expand vavle	2	VPd260WNaM.03020001	7130364	

GMV（L）-R860W6/Na-M , GMV（L）-R900W6/Na-M



List of components

No.	Part name	Quantity	Material code	Remarks
1	Left Side Plate	1	1314602	
2	Electric Box Components（left）	1	1394906	
3	Mainboard WZS801	1	30228002	
4	Mainboard WZ6535U	1	30226194	
5	Three-bit Terminal BoardA	1	42011113	
6	Overcurrent protector HD-13.2-22/UO-10-13	1	46020112	
7	AC Contactor GC3-22/11KK	1	44010236	
8	Single-phase Air Switch (4WAY)	1	45020203	
9	Overcurrent breaker (3/40A) C45N.6A QF1/C65N	1	45020203	
10	Transformer 48X26G	1	43110233	
11	Rear panel	1	01544104P	
12	Gas equilibrium tube sub-assy2	1	6114112	
13	Discharge Tube Sub-Assy2	1	4634127	
14	Inhalation Tube Sub-Assy 2	1	4674121	
15	Inhalation Tube Sub-Assy 4	1	4674126	
16	Condensor component (left)	1	1124306	
17	Saparation component	1	441410301	
18	注氟嘴(R410A)	1	61200101	
19	Collect Gas Pipe Sub-assy	1	4674122	
20	Liquid by-pass sub-assy4	1	4324208	
21	Liquid by-pass sub-assy5	1	4324209	
22	Liquid by-pass sub-assy6	1	4324210	
23	Electromagnetic valve FDF2A	3	43000054	
24	Electromagnetic valve componnet	3	4304000602	
25	Motor fix support	2	1335801	
26	Fan(black)	2	10355801	
27	Motor SWB800A	2	15704602	
28	Gas by-pass valve sub-assy	1	7334135	
29	Electromagnetic valve FDF2A	1	43000054	
30	Electromagnetic valve component	1	4304000618	
31	Accumulator outlet sub-assy	1	4324450	
32	Cooling pipe 1	1	4324217	
33	Cooling pipe 2	1	4324218	
34	Bidirection Accumulator	1	7228780	
35	Accumulator outlet sub-assy	1	4324450	
36	Air Collection Pipe Sub-assy	1	463417601	
37	Sensor(high pressure)	1	32210103	
38	Front lining board sub-assy	2	01264111P	
39	Condenser cover1	1	01264108P	
40	Rear lining board sub-assy	2	01264113P	
41	Crossbeam1	1	01874130P	

continue

No	Name	Qty	Material Code	Remarks
42	Condenser Cover 2	1	01264109P	
43	Top cover plate	4	01264110P	
44	Stream lined dome(grey)	2	22265801	
45	Crossbeam2	1	01874131P	
46	Rear isolation sheet	4	22414101	
47	Rear Column	2	01854102P	
48	Rear Column1	1	1854102	
49	Condenser Cover 3	1	01264137P	
50	Condenser Cover 4	1	01264138P	
51	4-way Valve Sub-Assys	1	4144133	Not available in cooling only unit
52	Filer φ19	1	7210037	
53	ball valve 1-3/8(R410A)	1	7380010	
54	Middle column	1	01854106P	
55	Condeser assy(right)	1	1124305	
56	Collect Gas Pipe Sub-assy	1	4674122	
57	Seperator component	1	441410301	
58	注氟嘴(R410A)	1	61200101	
59	Right side plate	1	1314604	
60	Electric Box Components (right) GMV-R900W6/Na-N1	1	1394907	
61	mainboard WZS801	1	30228002	
62	mainboard1 WZ6535N	1	30226195	
63	Three-bit Terminal BoardA	1	42011113	
64	Overcurrent protector HD-13.2-22/UO-10-13	1	46020112	
65	AC Contactor GC3-22/11KK	1	44010236	
66	Single-phase Air Switch	1	45020203	
67	Overcurrent breaker (3/40A) C45N.6A QF1/C65N	1	45020203	
68	Transformer 48X26G	1	43110233	
69	Gas equilibrium tube sub-assy1	1	6114111	
70	Electric expand vavle fixed support	1	1804118	
71	Cooling Coil 2	1	4324233	
72	Oil Separator sub-assy2	6	4324200	
73	Oil Separator	1	7424105	
74	Filter φ16	1	7210031	
75	Oil Separator fixed support	1	1804119	
76	Inhalation Tube Sub-Assy 1	1	4674120	
77	Inhalation Tube Sub-Assy 3	1	4674127	
78	Gas Separator outlet sub-assy	1	432422301	
79	sensor(low pressure)	1	32210100	
80	Discharge Tube Sub-Assy1	1	4634126	
81	Liquid by-pass sub-assy1	1	4324205	
82	electromagnetic valve FDF2A	1	43000054	
83	electromagnetic valve components	1	4304000610	

84	Liquid by-pass sub-assy2	1	4324206	

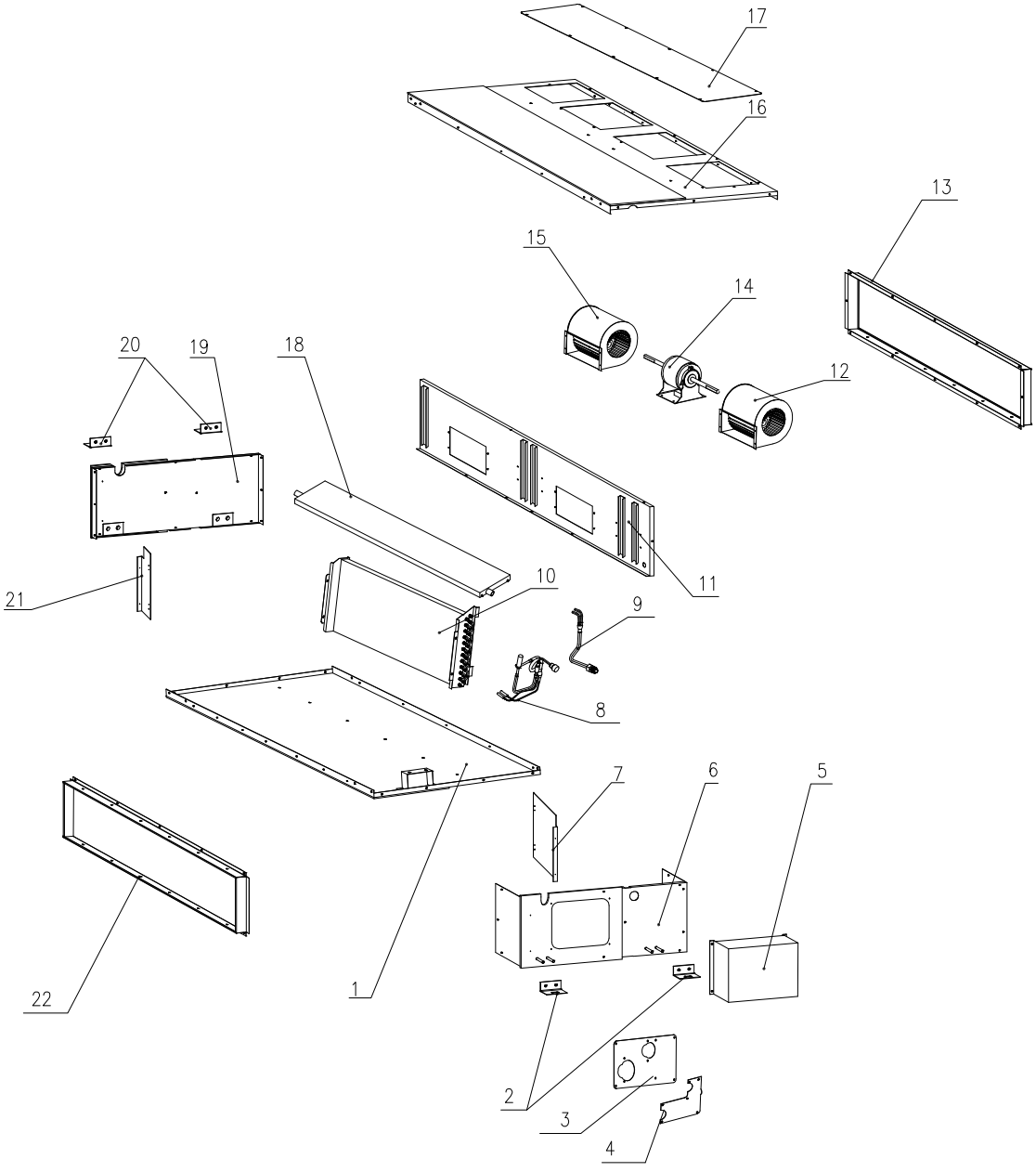
continue

No	Name	Qty	Material code	Remarks
85	Electromagnetic valve FDF2A	1	43000054	
86	Electromagnetic valvecomponent	1	4304000610	
87	Liquid by-pass sub-assy3	1	4324207	
88	Electromagnetic valve FDF2A	1	43000054	
89	Electromagnetic valve component	1	4304000605	
90	Gas-liquid Separator	2	7424103	
91	Connecting pipe1(Gas-liquid Separator)	1	5024223	
92	Connecting pipe2(Gas-liquid Separator)	1	5024224	
93	Steam Inlet Pipe2	1	4324222	
94	Oil Balance Tube Assy 1	1	6114107	
95	Oil Balance Tube Assy 2	1	6114109	
96	Compressor and fittings ZPD72KCE-TFD-433	1	100534	
97	Compressor and fittings ZP67KCE-TFD-420	5	100532	
98	Installation Accessory	4	01874107P	
99	Liquid Valve Assy 3/4	1	7334103	
100	L pipe	2	5020310	
101	L pipe	2	5020310	
102	Front vertical prop sub-assy	2	01854103P	
103	Base Plate Assy 1	1	01194106P	
104	Front vertical prop sub-assy	1	01854103P	
105	underpan component 2	1	01194108P	
106	Reinforced bar assy	1	01874121P	
107	Beam of base sub-assy 1	1	01874117P	
108	Carling of base sub-assy1	1	01874126P	
109	Beam of base sub-assy 2	1	01874118P	
110	Beam of base sub-assy 3	1	01874119P	
111	Carling of base sub-assy2	1	01874127P	
112	Beam of base sub-assy 4	1	01874120P	
113	Front panel	2	01544103P	
114	panel1	1	01544101P	
115	panel3	1	01544110P	
116	panel2	1	0154410901P	
117	Tube-exit Plate 1	1	02224104P	
118	Tube-exit Plate 2	1	0222410501P	
119	4-way Valve Sub-Assy	1	4300040032	Not available in cooling only unit

5.2 Exploded View of Indoor Unit and List of Component

1) Duct type indoor unit

GMV（L）-R22P/Na-K, GMV（L）-R25P/Na-K, GMV（L）-R28P/Na-K, GMV（L）-R36P/Na-K, GMV（L）-R45P/Na-K
GMV（L）-R50P/Na-K, GMV（L）-R56P/Na-K, GMV（L）-R71P/Na-K, GMV（L）-R80P/Na-K



List of components

No	Name	Material Code	Qty			
			GMVL-R22P/Na-K	GMVL-R25P/Na-K	GMVL-R28P/Na-K	GMVL-R36P/Na-K
1	Upper Cover Plate Assy	01259052	1	1	1	1
2	Hook	02112446	2	2	2	2
3	Seal of Left Side Plate	01499051	1	1	1	1
4	Seal of Connection Pipe	01499053	1	1	1	1
5	Electric Box Components	01394635	1	1		
		01394636			1	
		01394637				1
6	Left Side Plate Sub-assy	01308788	1	1	1	1
7	Left Support of Evaporator	01078774	1	1	1	1
8	Liquid-entered Pipe Sub-assy	03334601	1	1		
		03338810			1	1
9	Collect Gas Pipe Sub-assy	01305018	1	1		
		03828817			1	1
10	Evaporator Sub-assy	01038785	1	1		
		01038786			1	1
11	Fan Fixed Plate	01339095	1	1	1	1
12	Centifugal Fan	10319051	1	1	1	1
13	Border Plate Assy of Air Return End	01499055	1	1	1	1
14	Motor PG20E	15019522			1	1
	Motor FG20C	15019053	1	1		
15	Centifugal Fan	10319051	1	1	1	1
16	Bottom Cover	01259086	1	1	1	1
17	Cover of Air inlet	01259056	1	1	1	1
18	Water Tray Assy	01279051	1	1	1	1
19	Right side plate assy	01309055	1	1	1	1
20	Hook	02112446	2	2	2	2
21	Right Evaporator Support	01079056	1	1	1	1
22	Border Plate Assy of Air Return End	01498783	1	1	1	1

List of components

No	Name	Material Code	Qty			
			GMV-R22P/Na-K	GMV-R25P/Na-K	GMV-R28P/Na-K	GMV-R36P/Na-K
1	Upper Cover Plate Assy	1259052	1	1	1	1
2	Hook	2112446	2	2	2	2
3	Seal of Left Side Plate	1499051	1	1	1	1
4	Seal of Connection Pipe	1499053	1	1	1	1
5	Electric Box Components	1408739	1	1		
		1394605			1	
		1394604				1
6	Left Side Plate Sub-assy	1308788	1	1	1	1
7	Left Support of Evaporator	1078774	1	1	1	1
8	Liquid-entered Pipe Sub-assy	3334601	1	1		
		3338810			1	1
9	Collect Gas Pipe Sub-assy	1305018	1	1		
		3828817			1	1
10	Evaporator Sub-assy	1038785	1	1		
		1038786			1	1
11	Fan Fixed Plate	1339095	1	1	1	1
12	Centifugal Fan	10319051	1	1	1	1
13	Border Plate Assy of Air Return End	1499055	1	1	1	1
14	Motor PG20E	15019522			1	1
	Motor FG20C	15019053	1	1		
15	Centifugal Fan	10319051	1	1	1	1
16	Bottom Cover	1259086	1	1	1	1
17	Cover of Air inlet	1259056	1	1	1	1
18	Water Tray Assy	1279051	1	1	1	1
19	Right side plate assy	1309055	1	1	1	1
20	Hook	2112446	2	2	2	2
21	Right Evaporator Support	1079056	1	1	1	1
22	Border Plate Assy of Air Return End	1498783	1	1	1	1

List of components

No	Name	Material Code	Qty	
			GMVL-R45P/Na-K	GMVL-R50P/Na-K
1	Upper Cover Plate Assy	1259064	1	1
2	Hook	2112446	2	2
3	Seal of Connection Pipe 2	1498644	1	1
4	Seal of Connection Pipe 1	1498604	1	1
5	Electric Box Components	1394638	1	
		1394639		1
6	Left Side Plate Sub-assy	1308668	1	1
7	Left Support of Evaporator	1078629	1	1
8	Liquid-entered Pipe Sub-assy	4324601	1	1
9	Collect Gas Pipe Sub-assy	4674601	1	1
10	Evaporator Sub-assy	1038623	1	1
11	Fan Fixed Plate	1339058	1	1
12	Centifugal Fan	10319051	1	1
13	Side Plate of Return Air Frame	1499061	1	1
14	Motor FG70B	15018322	1	1
15	Centifugal Fan	10319051	1	1
16	Bottom Cover	1258649	1	1
17	Cover of Air inlet	1258650	1	1
18	Water Tray Sub-Assy	1278633	1	1
19	Right side plate assy	1308670	1	1
20	Hook	2112446	2	2
21	Right Support of Evaporator	1078625	1	1
22	Side Plate of Return Air Frame	1498641	1	1

List of components

No	Name	Material Code	Qty	
			GMV-R45P/Na-K	GMV-R50P/Na-K
1	Upper Cover Plate Assy	1259064	1	1
2	Hook	2112446	2	2
3	Seal of Connection Pipe 2	1498644	1	1
4	Seal of Connection Pipe 1	1498604	1	1
5	Electric Box Components	1394607	1	
		1394608		1
6	Left Side Plate Sub-assy	1308668	1	1
7	Left Support of Evaporator	1078629	1	1
8	Liquid-entered Pipe Sub-assy	4324601	1	1
9	Collect Gas Pipe Sub-assy	4674601	1	1
10	Evaporator Sub-assy	1038623	1	1
11	Fan Fixed Plate	1339058	1	1
12	Centifugal Fan	10319051	1	1
13	Side Plate of Return Air Frame	1499061	1	1
14	Motor FG70B	15018322	1	1
15	Centifugal Fan	10319051	1	1
16	Bottom Cover	1258649	1	1
17	Cover of Air inlet	1258650	1	1
18	Water Tray Sub-Assy	1278633	1	1
19	Right side plate assy	1308670	1	1
20	Hook	2112446	2	2
21	Right Support of Evaporator	1078625	1	1
22	Side Plate of Return Air Frame	1498641	1	1

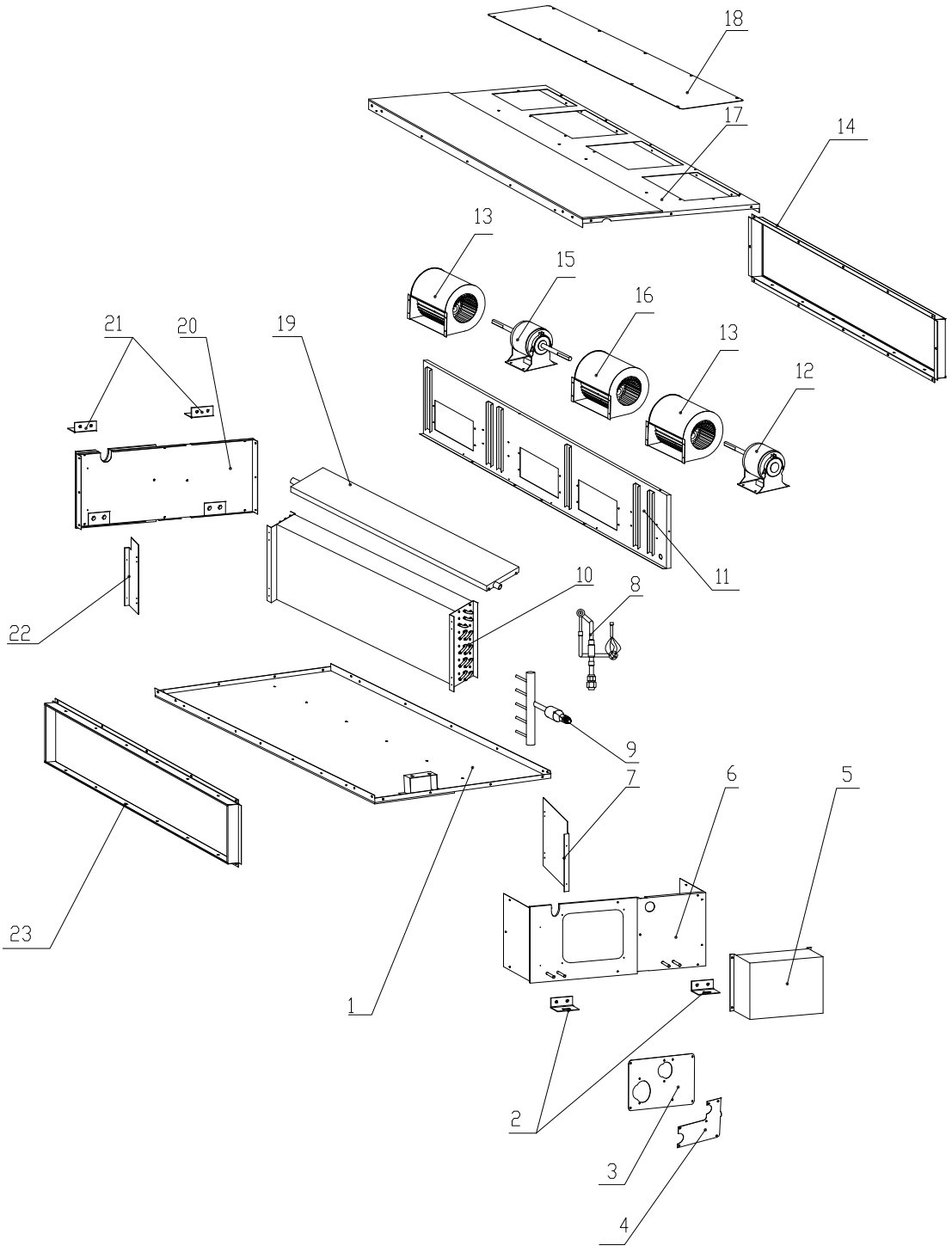
List of compnents

No	Name	Material Code	Qty		
			GMVL-R56P/Na-K	GMVL-R71P/Na-K	GMVL-R80P/Na-K
1	Upper Cover Plate Assy	1258652	1	1	1
2	Hook	2112446	2	2	2
3	Seal of Left Side Plate	1308680	1	1	1
4	Seal of Connection Pipe	1498610	1	1	1
5	Electric Box Components	1394640	1	1	1
6	LLeft Side Plate Sub-assy	1308676	1	1	1
7	Left Support of Evaporator	1078603	1	1	1
8	Liquid-entered Pipe Sub-assy	4324603	1	1	1
9	Collect Gas Pipe Sub-assy	4674602	1	1	1
10	Evaporator Sub-assy	1054601	1	1	1
11	Fan Fixed Plate	1338631	1	1	1
12	Fan (left)SYP-200/190J-1	15018603	1	1	1
13	Border Plate Assy of Air Return End	1499074	1	1	1
14	Motor FG150B	15018612	1	1	1
15	Fan(right)SYP-200/190J-1	15018604	1	1	1
16	Bottom Cover assy	1258612	1	1	1
17	Cover of Air inlet	1258614	1	1	1
18	Water Tray Assy	1278612	1	1	1
19	Right side plate assy	1308677	1	1	1
20	Hook	2112446	2	2	2
21	Right Evaporator Support	1078604	1	1	1
22	Side Plate of Return Air Frame	1498612	1	1	1

List of components

No	Name	Material Code	Qty		
			GMV-R56P/Na-K	GMV-R71P/Na-K	GMV-R80P/Na-K
1	Upper Cover Plate Assy	1258652	1	1	1
2	Hook	2112446	2	2	2
3	Seal of Left Side Plate	1308680	1	1	1
4	Seal of Connection Pipe	1498610	1	1	1
5	Electric Box Components	1394609	1	1	1
6	Left Side Plate Sub-assy	1308676	1	1	1
7	Left Support of Evaporator	1078603	1	1	1
8	Liquid-entered Pipe Sub-assy	4324603	1	1	1
9	Collect Gas Pipe Sub-assy	4674602	1	1	1
10	Evaporator Sub-assy	1054601	1	1	1
11	Fan Fixed Plate	1338631	1	1	1
12	Fan (left)SYP-200/190J-1	15018603	1	1	1
13	Border Plate Assy of Air Return End	1499074	1	1	1
14	Motor FG150B	15018612	1	1	1
15	Fan(right)SYP-200/190J-1	15018604	1	1	1
16	Bottom Cover assy	1258612	1	1	1
17	Cover of Air inlet	1258614	1	1	1
18	Water Tray Assy	1278612	1	1	1
19	Right side plate assy	1308677	1	1	1
20	Hook	2112446	2	2	2
21	Right Evaporator Support	1078604	1	1	1
22	Side Plate of Return Air Frame	1498612	1	1	1

GMV（L）-R90P/Na-K, GMV（L）-R112P/Na-K, GMV（L）-R140P/Na-K



List of components

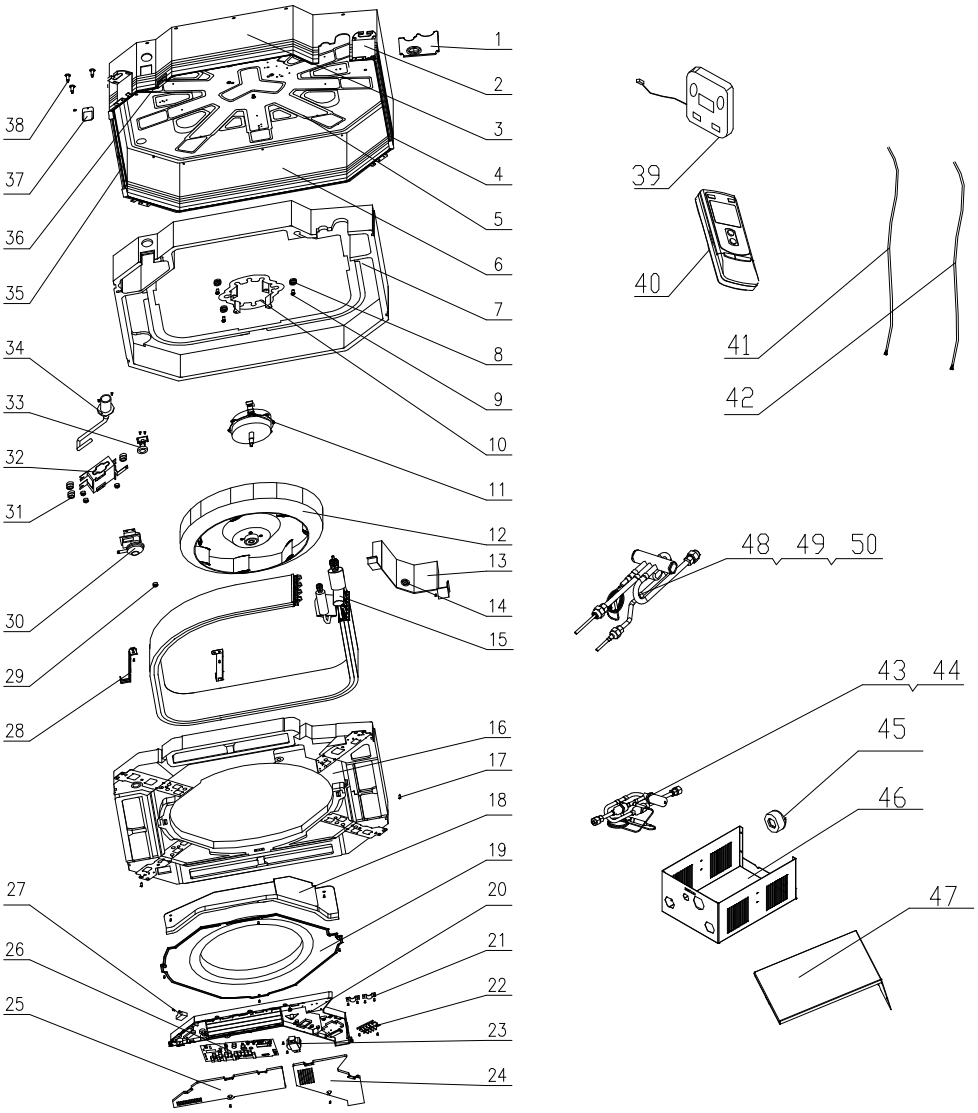
NO.	Drawing NO.	Name	Material code	Qty		
				GMVL-R90 P/Na-K	GMVL-R112 P/Na-K	GMVL-R140 P/Na-K
1	FGRD10I.01010000	Upper Cover Plate Assy	1258606	1	1	1
2	FGRD10I.00000009	Hook	2118504	2	2	2
3	FGRD10I.04010002	Seal of Left Side Plate	1308673	1	1	1
4	FGRD10I.04010010	Seal of Connection Pipe	1498601	1	1	1
5	VR120PNaK.12000000	Electric Box Components	1394602	1	1	1
6	FGRD10I.04010000	Left Side Plate Sub-assy	1308676	1	1	1
7	FGRD10I.09010005	Left Support of Evaporator	1078603		1	1
8	VLR100PNaK.01010000	Liquid-entered Pipe Sub-assy	3338802	1	1	1
9	KFR120PNA1A.10020000	Collect Gas Pipe Sub-assy	3632459	1	1	1
10	FGRD10I.09010000	Evaporator Sub-assy	1038624	1	1	1
11	FGRD10I.03010000	Fan Fixed Plate	1338630	1	1	1
12	FGRD10I.01010009a	Motor FG75B	15018613	1	1	1
13	FGRD10I.03010003	Fan (left)SYP-200/190J-1	15018603	2	2	2
14	FGR12HAI.07010000	Border Plate Assy of Air Return End	1499066	1	1	1
15	FGRD10I.01010008a	Motor FG150B	15018612	1	1	1
16	FGRD10I.03010003	Fan(right)SYP-200/190J-1	15018604	1	1	1
17	FGRD10I.02000000	Bottom Cover assy	1258603	1	1	1
18	FGRD10I.02010002	Cover of Air inlet	1258602	1	1	1
19	FGRD10I.08000000	Water Tray Assy	1278603	1	1	1
20	FGRD10I.05010000	Right side plate assy	1308677	1	1	1
21	FGRD10I.00000009	Hook	2118504	2	2	2
22	FGRD10I.09010006	Right Evaporator Support	1078604	1	1	1
23	FGRD10I.06000000	Side Plate of Return Air Frame	1498608	1	1	1

List of components

NO.	Drawing NO.	Name	Material code	Qty		
				GMV-R90 P/Na-K	GMV-R112 P/Na-K	GMV-R140 P/Na-K
1	FGRD10I.01010000	Upper Cover Plate Assy	1258606	1	1	1
2	FGRD10I.00000009	Hook	2118504	2	2	2
3	FGRD10I.04010002	Seal of Left Side Plate	1308673	1	1	1
4	FGRD10I.04010010	Seal of Connection Pipe	1498601	1	1	1
5	VLR120PNaK.12000000	Electric Box Components	1394601	1	1	1
6	FGRD10I.04010000	Left Side Plate Sub-assy	1308676	1	1	1
7	FGRD10I.09010005	Left Support of Evaporator	1078603		1	1
8	VLR100PNaK.01010000	Liquid-entered Pipe Sub-assy	3338802	1	1	1
9	KFR120PNA1A.10020000	Collect Gas Pipe Sub-assy	3632459	1	1	1
10	FGRD10I.09010000	Evaporator Sub-assy	1038624	1	1	1
11	FGRD10I.03010000	Fan Fixed Plate	1338630	1	1	1
12	FGRD10I.01010009a	Motor FG75B	15018613	1	1	1
13	FGRD10I.03010003	Fan(left)SYP-200/190J-1	15018603	2	2	2
14	FGR12HAI.07010000	Border Plate Assy of Air Return End	1499066	1	1	1
15	FGRD10I.01010008a	Motor FG150B	15018612	1	1	1
16	FGRD10I.03010003	Fan(right)SYP-200/190J-1	15018604	1	1	1
17	FGRD10I.02000000	Bottom Cover assy	1258603	1	1	1
18	FGRD10I.02010002	Cover of Air inlet	1258602	1	1	1
19	FGRD10I.08000000	Water Tray Assy	1278603	1	1	1
20	FGRD10I.05010000	Right side plate assy	1308677	1	1	1
21	FGRD10I.00000009	Hook	2118504	2	2	2
22	FGRD10I.09010006	Right Evaporator Support	1078604	1	1	1
23	FGRD10I.06000000	Side Plate of Return Air Frame	1498608	1	1	1

2) Cassette type indoor unit

➢ Exploded View of GMV-Rh28T/Na-K, GMV-Rh36T/Na-K, GMV-Rh45T/Na-K, GMV-Rh50T/Na-K:

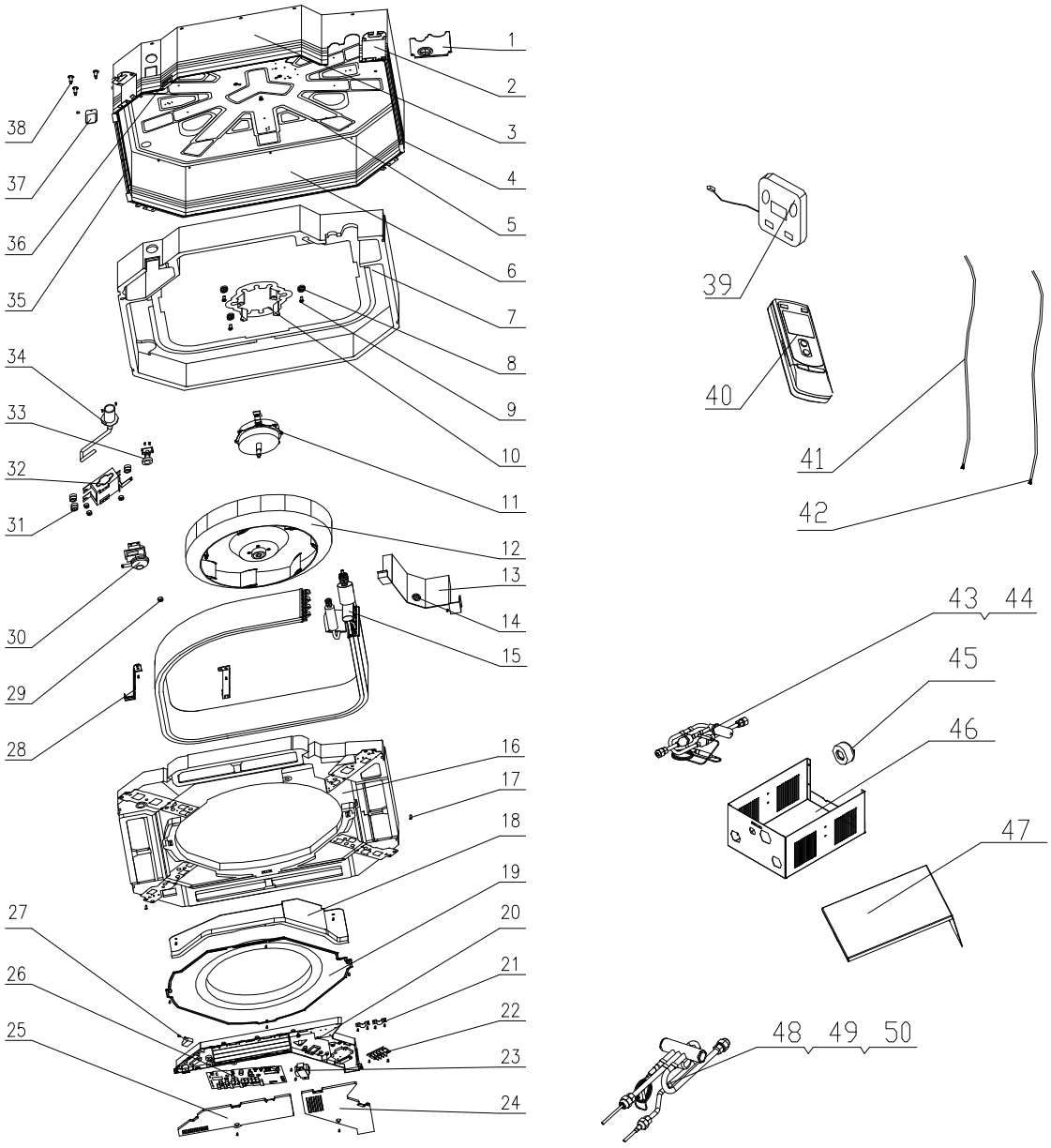


Parts List of:
GMV-Rh28T/Na-K, GMV-Rh36T/Na-K, GMV-Rh45T/Na-K, GMV-Rh50T/Na-K:

No	Description	Qty	Part Code
			GMV-Rh28T/Na-K
	Exploded View		VRh28TNaK.BZ000000
	Product Code		CM501N0131
1	Tube Exit Plate	1	` 01382710
2	Body Fixed Plate	4	` 01332701
3	Front Side Plate	1	` 01302717
4	Left Side Plate	1	` 01302740
5	Base Plate	1	` 01222702
6	Rear Side Plate	1	` 01302719
7	Bottom Foam	1	` 52012716
8	Motor Gasket	4	` 76712711
9	Bolt	4	`70210051
10	Motor Fixer	1	` 01702701
11	Motor FN35D-1	1	` 15704901
12	Centrifugal Fan	1	` 10312721
13	Evaporator Connection	1	` 01072004
14	Cable-cross Loop	1	` 76513101
15	Evaporator Plate	1	`01024163
16	Water Tray	1	` 12412701
17	Screw	4	`70140032
18	Electric Box Base Plate	1	` 01412721
19	Flow Guide Loop	1	` 10372701
20	Electric Box	1	` 20102701
21	Wire Clamp	2	`71010102
22	Terminal Board	1	`42011142
23	Transformer	1	`43110233
24	Electric Box Cover I	1	`20102702
25	Electric Box Cover II	1	`20102703
26	Main PCB	1	` 30226313
27	Capacitor	1	` 33010027
28	Evaporator Support	2	` 01072003
29	Nut with Washer M6	4	`70310012
30	Pipe Pump PJV-1415	1	` 43130324
31	Pump Gasket	3	` 76712702
32	Pump Support	1	` 01332001
33	Water Level Switch	1	` 45010201
34	Drainage Pipe Pump	1	` 05232721

35	Right Side Plate	1	` 01302710
36	Cable-cross Loop	1	` 76512702
37	Pump Cover	1	` 01252710
38	Bolt	4	` 70212711
39	Display Board	1	`30296309
40	Remote Controller	1	` 305125063
41	Signal Cable	1	` 400103953
42	Connecting Wire	1	` 40010232
43	Electric Expansion Valve Sub-Assy	1	` 07334319
44	Electronic Expansile Valve SPF-16D70	1	` 07334191
45	Magnet Coil for Electronic Expansion Valve	1	` 430001087
46	Bottom Cover Plate	1	` 01264163P
47	Upper Cover Plate	1	` 01264164P
48	4-wayValveSub-Assy	1	` 04144163
49	4-Way Vavle	1	` 430004032
50	4-way Valve Fittings	1	` 430004005

➢ Exploded View of GMV-Rh56T/Na-K, GMV-Rh63T/Na-K, GMV-Rh71T/Na-K, GMV-Rh80T/Na-K:

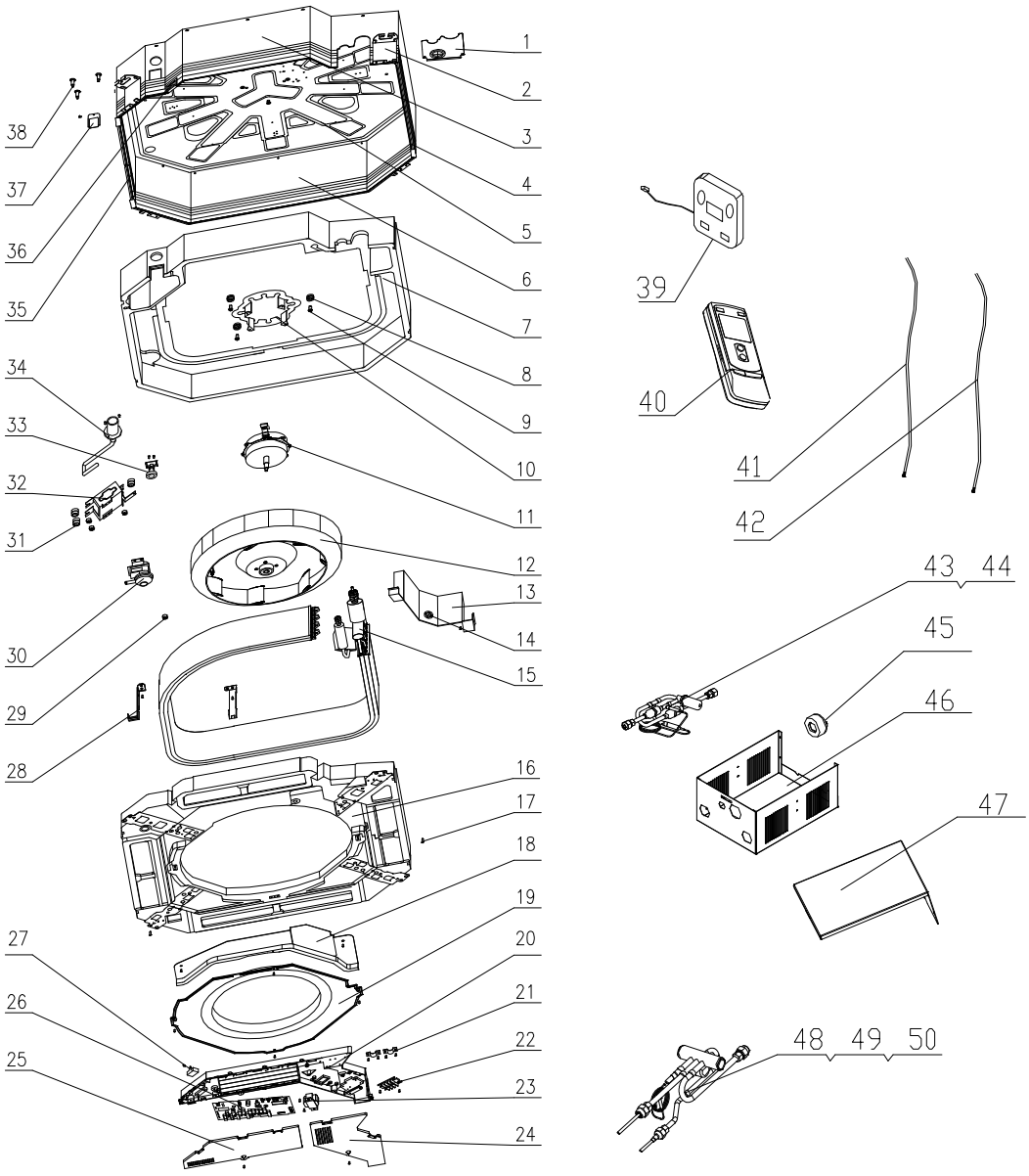


Parts List of GMV-Rh56T/Na-K, GMV-Rh63T/Na-K, GMV-Rh71T/Na-K, GMV-Rh80T/Na-K:

No	Description	Qty	Part Code
			GMV-Rh56T/Na-K
	Exploded View		VRh56TNaK.BZ000000
	Product Code		CM501N0171
1	Tube Exit Plate	1	` 01382711
2	Body Fixed Plate	4	` 01332701
3	Front Side Plate	1	` 01302718
4	Left Side Plate	1	` 01302715
5	Base Plate	1	` 01222702
6	Rear Side Plate	1	` 01302714
7	Bottom Foam	1	` 52012711
8	Motor Gasket	4	` 76712711
9	Bolt	4	`70210051
10	Motor Fixer	1	` 01702701
11	Motor FN35B-1	1	` 15704102
12	Centrifugal Fan	1	` 10312705
13	Evaporator Connection	1	` 01072710
14	Cable-cross Loop	1	` 76513101
15	Evaporator Plate	1	` 01004641
16	Water Tray	1	` 12412701
17	Screw	4	`70140032
18	Electric Box Base Plate	1	` 01412721
19	Flow Guide Loop	1	` 10372701
20	Electric Box	1	` 20102701
21	Wire Clamp	2	`71010102
22	Terminal Board	1	`42011142
23	Transformer	1	`43110233
24	Electric Box Cover I	1	`20102702
25	Electric Box Cover II	1	`20102703
26	Main PCB	1	` 30226313
27	Capacitor	1	` 33010027
28	Evaporator Support	2	`01072715
29	Nut with Washer M6	4	`70310012
30	Pipe Pump PJV-1415	1	` 43130324
31	Pump Gasket	3	` 76712702
32	Pump Support	1	`01332702
33	Water Level Switch	1	` 45010201
34	Drainage Pipe Pump	1	` 05230026
35	Right Side Plate	1	` 01302716
36	Cable-cross Loop	1	` 76512702

37	Pump Cover	1	` 01252711
38	Bolt	4	` 70212711
39	Display Board	1	`30296309
40	Remote Controller	1	` 305125063
41	Signal Cable	1	` 400103953
42	Connecting Wire	1	` 40010232
43	Electric Expansion Valve Sub-Assy	1	07334315
44	Electronic Expansile Valve SPF-18D88	1	`07334193
45	Magnet Coil for Electronic Expansion Valve	1	` 430001087
46	Bottom Cover Plate	1	` 01264163P
47	Upper Cover Plate	1	` 01264164P
48	4-wayValveSub-Assy	1	`04144156
49	4-Way Vavle	1	` 4300008201
50	4-way Valve Fittings	1	` 430004005

➢ Exploded View of GMV-Rh90T/Na-K, GMV-Rh100T/Na-K, GMV-Rh112T/Na-K, GMV-Rh125T/Na-K:



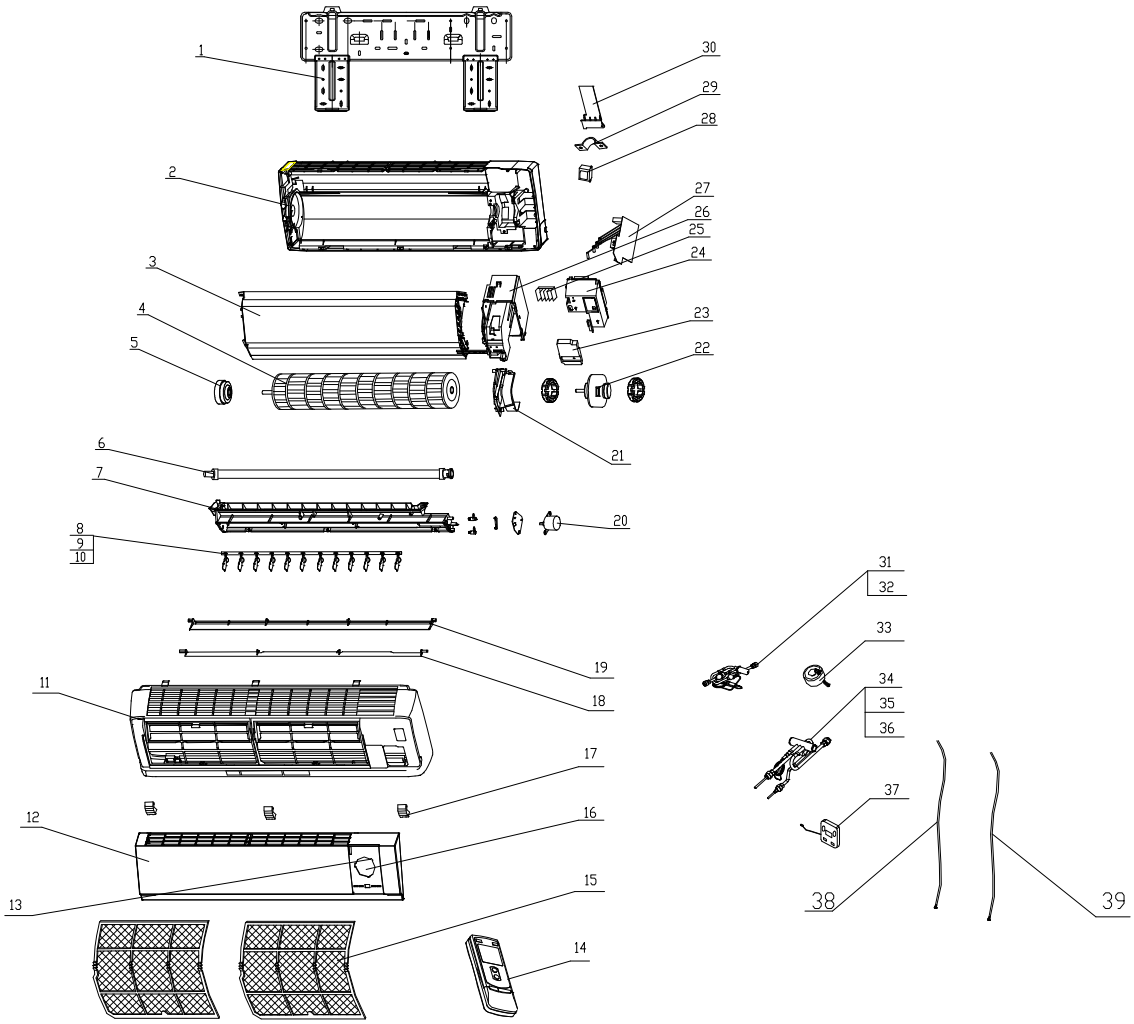
Parts List of GMV-Rh90T/Na-K, GMV-Rh100T/Na-K, GMV-Rh112T/Na-K, GMV-Rh125T/Na-K:

No	Description	Qty	Part Code
			GMV-Rh90T/Na-K
	Exploded View		VRh90TNaK.BZ000000
	Product Code		CM501N0201
1	Tube Exit Plate	1	` 01382711
2	Body Fixed Plate	4	` 01332701
3	Front Side Plate	1	` 01302713
4	Left Side Plate	1	` 01302711
5	Base Plate	1	` 01222702
6	Rear Side Plate	1	` 01302709
7	Bottom Foam	1	` 52012717
8	Motor Gasket	4	` 76712711
9	Bolt	4	`70210051
10	Motor Fixer	1	` 01702701
11	Motor FN60T-1	1	` 15704103
12	Centrifugal Fan	1	` 10310101
13	Evaporator Connection	1	` 01072733
14	Cable-cross Loop	2	` 76515202
15	Evaporator Plate	1	`01024195
16	Water Tray	1	` 12412701
17	Screw	4	`70140032
18	Electric Box Base Plate	1	` 01412721
19	Flow Guide Loop	1	`10372722
20	Electric Box	1	`20102701
21	Wire Clamp	2	`71010102
22	Terminal Board	1	`42011142
23	Transformer	1	`43110233
24	Electric Box Cover I	1	`20102702
25	Electric Box Cover II	1	`20102703
26	Main PCB	1	` 30226313
27	Capacitor	1	` 33010011
28	Evaporator Support	2	`01072708
29	Nut with Washer M6	4	`70310012
30	Pipe Pump PJV-1415	1	` 43130324
31	Pump Gasket	3	` 76712702
32	Pump Support	1	`01332721
33	Water Level Switch	1	` 45010201
34	Drainage Pipe Pump	1	` 05230026
35	Right Side Plate	1	` 01302712
36	Cable-cross Loop	1	` 76512702

37	Pump Cover	1	` 01252711
38	Bolt	4	` 70212701
39	Display Board	1	`30296309
40	Remote Controller	1	` 305125063
41	Signal Cable	1	` 400103953
42	Connecting Wire	1	` 40010232
43	Electric Expansion Valve Sub-Assy	1	` 07334314
44	Electronic Expansile Valve VPF-25D*B3	1	` 07334195
45	Magnet Coil for Electronic Expansion Valve	1	` 43000110
46	Bottom Cover Plate	1	` 01264163P
47	Upper Cover Plate	1	` 01264164P
48	4-wayValveSub-Assy	1	` 04144156
49	4-Way Vavle	1	` 4300008201
50	4-way Valve Fittings	1	` 430004005

3)Wall mounted type indoor unit

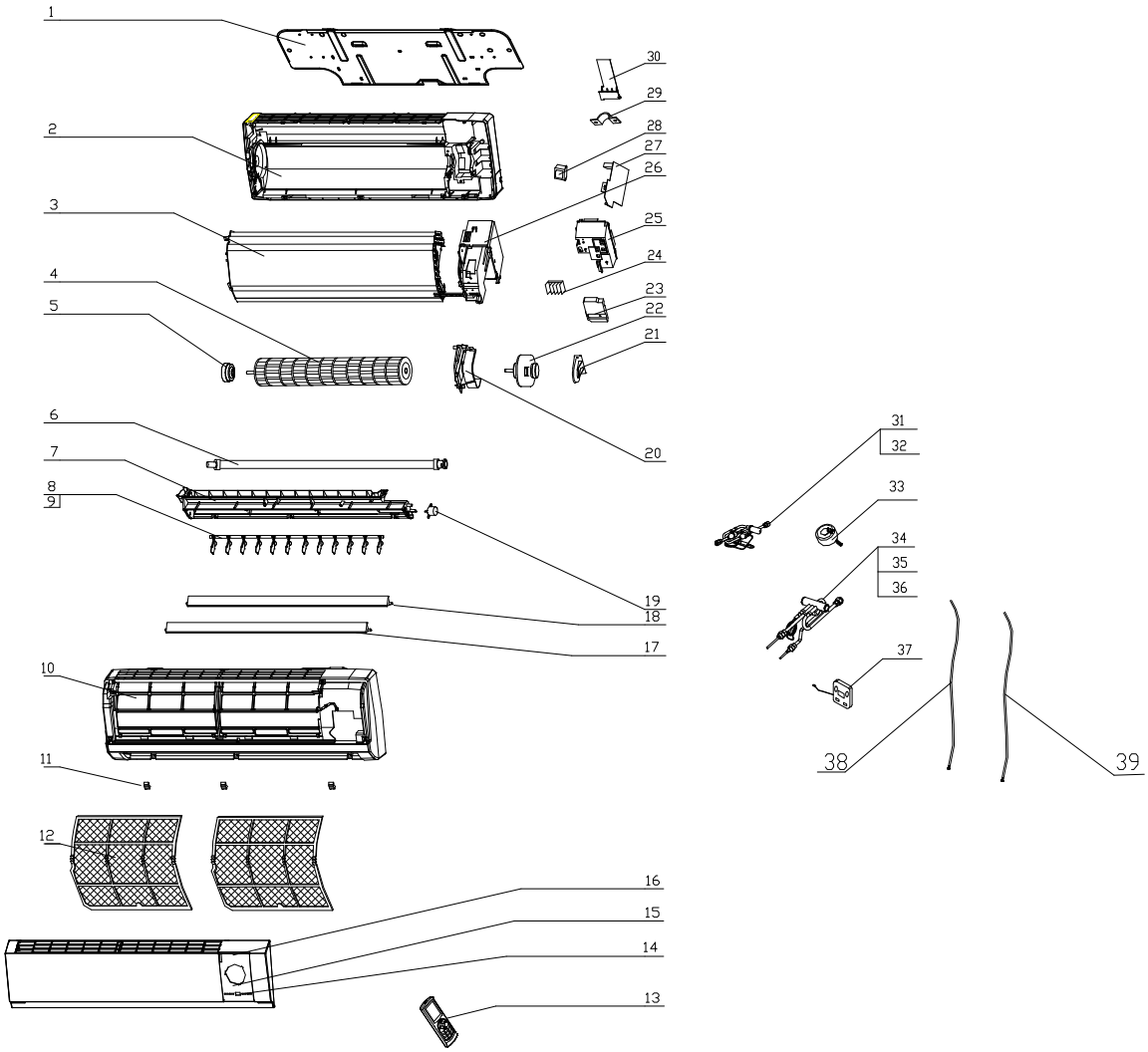
- Exploded View of GMV-Rh22G/Na-K, GMV-Rh28GT/Na-K:



Parts List of GMV-Rh22G/Na-K, GMV-Rh28GT/Na-K:

No	Description	Qty	Part Code
	Exploded View		VRh22GNaK.BZ000000
	Product Code		CM100N0090
1	Wall-Mounting Frame	1	01252220
2	Rear Case	1	222020016
3	Evaporator Assy	1	0100462801
4	Cross Flow Fan	1	10352001
5	Fan Bearing	1	76512203
6	Drainage Pipe	1	0523001401
7	Water Tray	1	20182027
8	Swing Louver	12	10512032
9	Swing Link 1	1	10582002
10	Swing Link 2	1	10582003
11	Front Case	1	200022107
12	Front Panel	1	200022092C
13	Decorate Piece	1	68012019
14	Remote Controller Y512	1	305125063
15	Filter	2	11122002
16	Receiver Board	1	30545702
17	Screw Cover	3	242520062
18	Guide Louver	1	105120332
19	Guide Louver	1	105120342
20	Stepping Motor MP28VB	1	15012086
21	Motor Clamp	1	26112014
22	Motor FN14G	1	150121081
23	Electric Box Cover	1	20122082
24	Covering Plate	1	20112058S
25	Terminal Board	1	42010266
26	Electric Box	1	20112057
27	Main PCB	1	30224101
28	Transformer 48X26F	1	43110226
29	Wire Clamp	1	71010103
30	Rear Clamp	1	24242001
31	EXV sub-assy	1	07334319
32	Electronic Expansile Valve	1	07334191
33	Magnet Coil for Electronic Expansion Valve	1	43000105
34	4-way Valve Sub-Assy	1	` 04144163
35	4-way Valve	1	` 430004032
36	4-way Valve Fittings	1	` 430004005
37	Display Board	1	` 30296309
38	Connecting Wire（communicate)	1	` 400103953
39	Connecting Wire	1	` 40010267

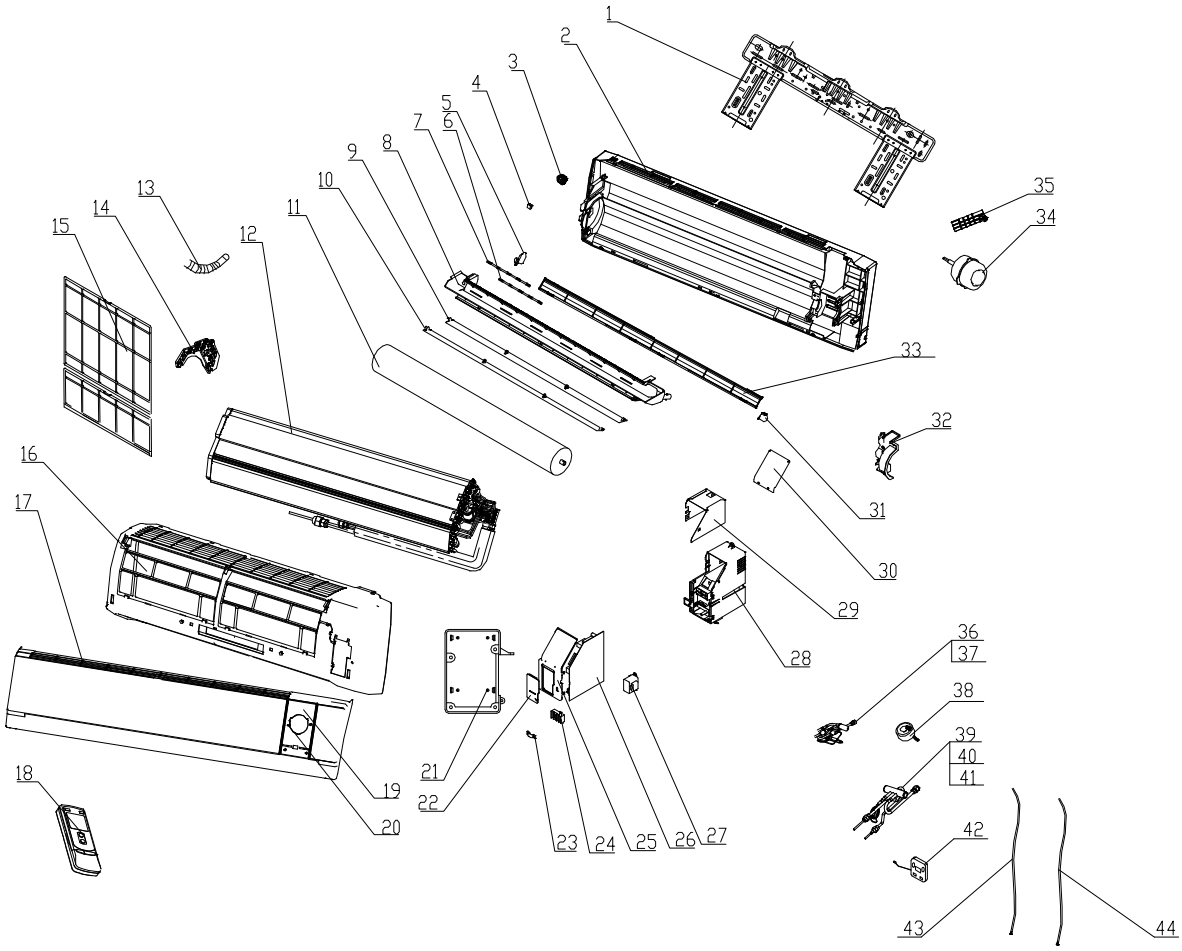
➢ Exploded View of GMV-Rh36G/Na-K, GMV-Rh45GT/Na-K:



Parts List of GMV-Rh36G/Na-K, GMV-Rh45GT/Na-K:

No	Description	Qty	Part Code
	Exploded View		VRh36GNaK.BZ000000
	Product Code		CM100N0110
1	Wall-Mounting Frame	1	01252384
2	Rear Case	1	222020503
3	Evaporator Assy	1	01004629
4	Cross Flow Fan	1	10352005
5	Fan Bearing	1	76712015
6	Drainage Pipe	1	0523001401
7	Water Tray	1	201820303
8	Swing Louver	12	105120413
9	Swing Link	1	105824398
10	Front Case	1	200022958
11	S crew Cover	3	242520072
12	Filter	2	11122440
13	Remote Controller Y512	1	305125063
14	Receiver Board 5H53EA	1	30545552
15	Decorate Piece	1	68012019
16	Screw Cover	1	200022921
17	Guide Louver（down）	1	261120432
18	Guide Louver（up）	1	261120422
19	Stepping Motor MP28EC	1	15212002
20	Right Motor Clamp	1	26112429
21	Motor FN14G	1	26152423
22	Motor FN22G	1	150120623
23	Electric Box Cover	1	20122081
24	Terminal Board	1	42010266
25	Covering Plate	1	20112060
26	Electric Box	1	20112059
27	Main PCB Z6H251A	1	30224101
28	Transformer 48X26F	1	43110226
29	Wire Clamp	1	71010103
30	Rear Clamp	1	261124307
31	EXV sub-assy	1	07334319
32	Electronic Expansile Valve	1	07334191
33	Magnet Coil for Electronic Expansion Valve	1	43000105
34	4-way Valve Sub-Assy	1	04144157
35	4-way Valve	1	`430004032
36	4-way Valve Fittings	1	`430004005
37	Display Board	1	`30296309
38	Connecting Wire（communicate)	1	`400103953
39	Connecting Wire	1	`40010267

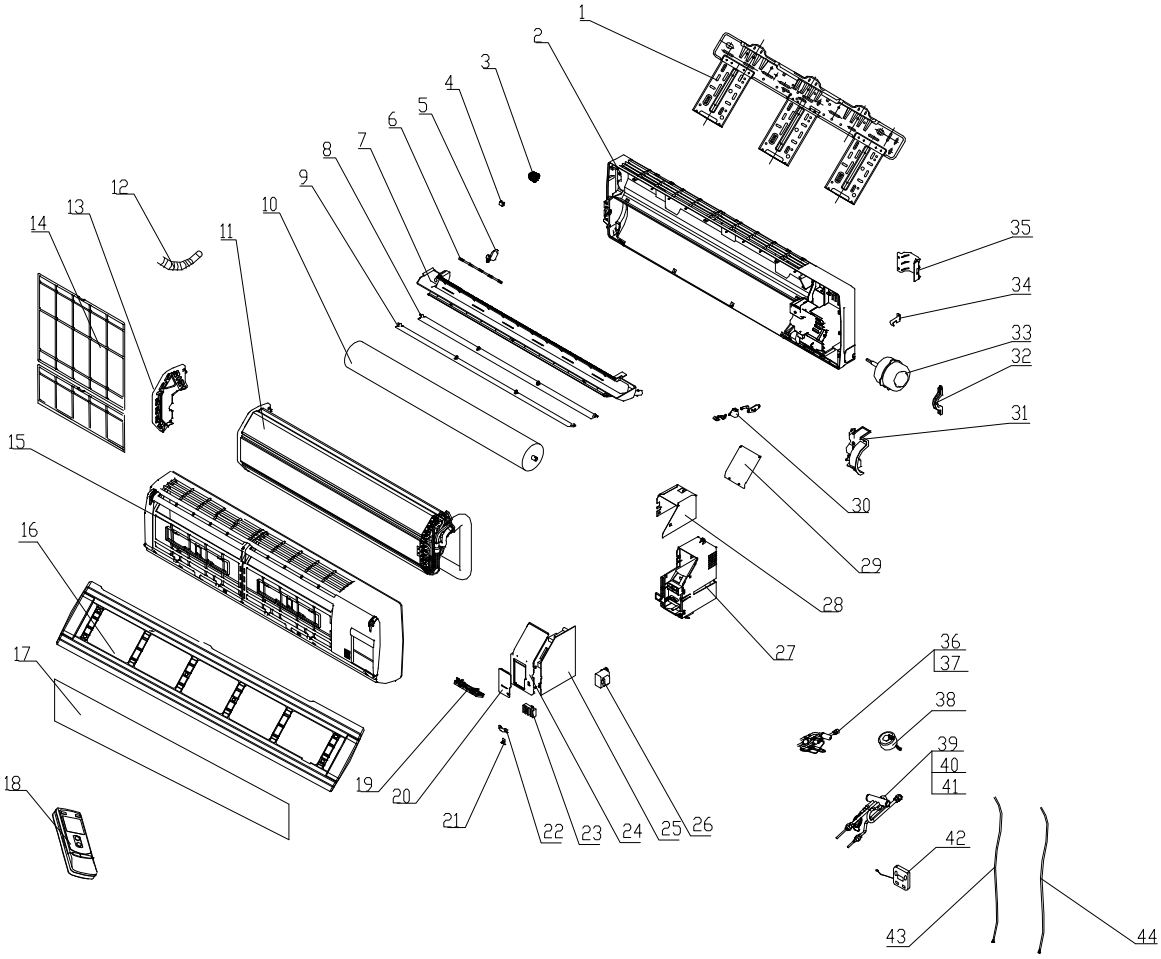
➢ Exploded View of GMV-Rh50G/Na-K, GMV-Rh56GT/Na-K:



Parts List of GMV-Rh50G/Na-K, GMV-Rh56GT/Na-K:

No	Description	Qty	Part Code
	Exploded View		VRh50GNaK.BZ000000
	Product Code		CM100N0130
1	Wall-Mounting Frame	1	01252004
2	Rear Case	1	22202329
3	O-Gasket of Cross Fan Bearing	1	76512203
4	Screw Cover	3	24252015
5	Swing Louver	11	10512429
6	Swing Link 1	1	10582057
7	Swing Link 2	1	10582058
8	Water Tray	1	20182057
9	Guide Louver（up）	1	10512085
10	Guide Louver（down）	1	10512086
11	Cross Flow Fan	1	10352022
12	Evaporator Assy	1	01024148
13	Drainage Pipe	1	0523001403
14	Evaporator Support	1	24212067
15	Filter	2	11122048
16	Front Case	1	200028625
17	Front Panel	1	20002805
18	Remote Controller Y512	1	305125063
19	Display Board	1	` 30545552
20	Magic Mirror	1	` 68012019
21	Displaying Light Board	1	22432071
22	Electric Box Cover 1	1	20112019
23	Wire Clamp	1	71010103
24	Terminal Board	1	42010266
25	Electric Box Cover 2	1	20112020
26	Main PCB Z6K251B	1	30224103
27	Transformer 57X25C	1	43110237
28	Electric Box	1	20112018
29	Lower Shield of Electric Box	1	01592037
30	Upper Shield of Electric Box	1	01592038
31	Stepping Motor	1	15212117
32	Motor Clamp	1	26112095
33	Helicoid tongue	1	26252009
34	Motor FN20X	1	150120671
35	Pipe Clamp	1	` 26112096
36	EXV sub-assy	1	07334319
37	Electronic Expansile Valve	1	07334191
38	Magnet Coil for Electronic Expansion Valve	1	43000105
39	4-way Valve Sub-Assy	1	04144157
40	4-way Valve	1	` 430004032
41	4-way Valve Fittings	1	` 430004005
42	Display Board	1	` 30296309
43	Connecting Wire（communicate)	1	` 400103953
44	Connecting Wire	1	` 40010267

➢ Exploded View of GMV-Rh71G/Na-K, GMV-Rh80GT/Na-K:

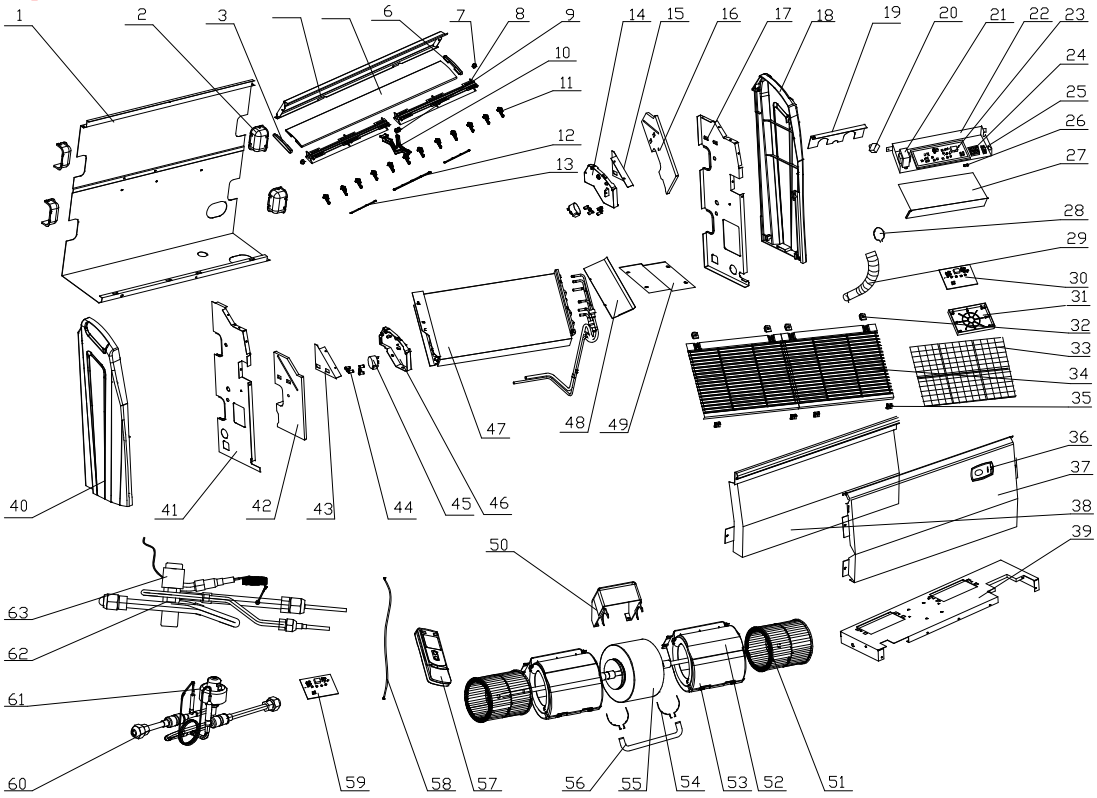


Parts List of GMV-Rh71G/Na-K, GMV-Rh80GT/Na-K:

No	Description	Qty	Part Code
	Exploded View		VRh71GNaK.BZ000000
	Product Code		CM100N0150
1	Wall-Mounting Frame	1	01252398
2	Rear Case	1	22202091
3	O-Gasket of Cross Fan Bearing	1	76512203
4	Screw Cover	3	242520053
5	Swing Louver	15	10512110
6	Swing Link	3	10582040
7	Water Tray	1	20182043
8	Guide Louver（up）	1	` 10512062
9	Guide Louver（down）	1	10512063
10	Cross Flow Fan	1	10352420
11	Evaporator Assy	1	0102411202
12	Drainage Pipe	1	0523001404
13	Evaporator Support（left）	1	24212041
14	Filter	1	11122051
15	Front Case	1	2000237001
16	Front Panel	1	20002698
17	Front Panel A	1	22432258
18	Remote Controller Y512	1	305125063
19	Receiver Board JD	1	30046093
20	Electric Box Cover	1	20102252
21	Switch Lever	1	10582007
22	Wire Clamp	1	71010103
23	Terminal Board T4B3A	1	42011233
24	Electric Box Cover	1	201022513
25	Main PCB Z64251A	1	30224105
26	Transformer 48X26G	1	43110233
27	Electric Box	1	20102250
28	Lower Shield of Electric Box	1	01592034
29	Upper Shield of Electric Box	1	01592033
30	Stepping Motor MP24GA	1	15212102
31	Evaporator Support（rihgt）	1	24212042
32	Motor Clamp	1	26112069
33	Motor FN26D	1	150121053
34	Fixer(evaporator)	1	02112009
35	Pipe Clamp	1	26112071
36	EXV sub-assy	1	` 07334315
37	Electronic Expansile Valve	1	` 07334193
38	Magnet Coil for Electronic Expansion Valve	1	43000105
39	4-way Valve Sub-Assy	1	` 04144156
40	4-way Valve	1	4300008201
41	4-way Valve Fittings	1	` 430004005
42	Display Board	1	` 30296309
43	Connecting Wire（communicate）	1	` 400103953
44	Connecting Wire	1	` 40010267

4) Floor ceiling type indoor unit

➢ Exploded View of GMV-Rh28Zd/Na-K, GMV-Rh36Zd /Na-K, GMV-Rh50Zd /Na-K:

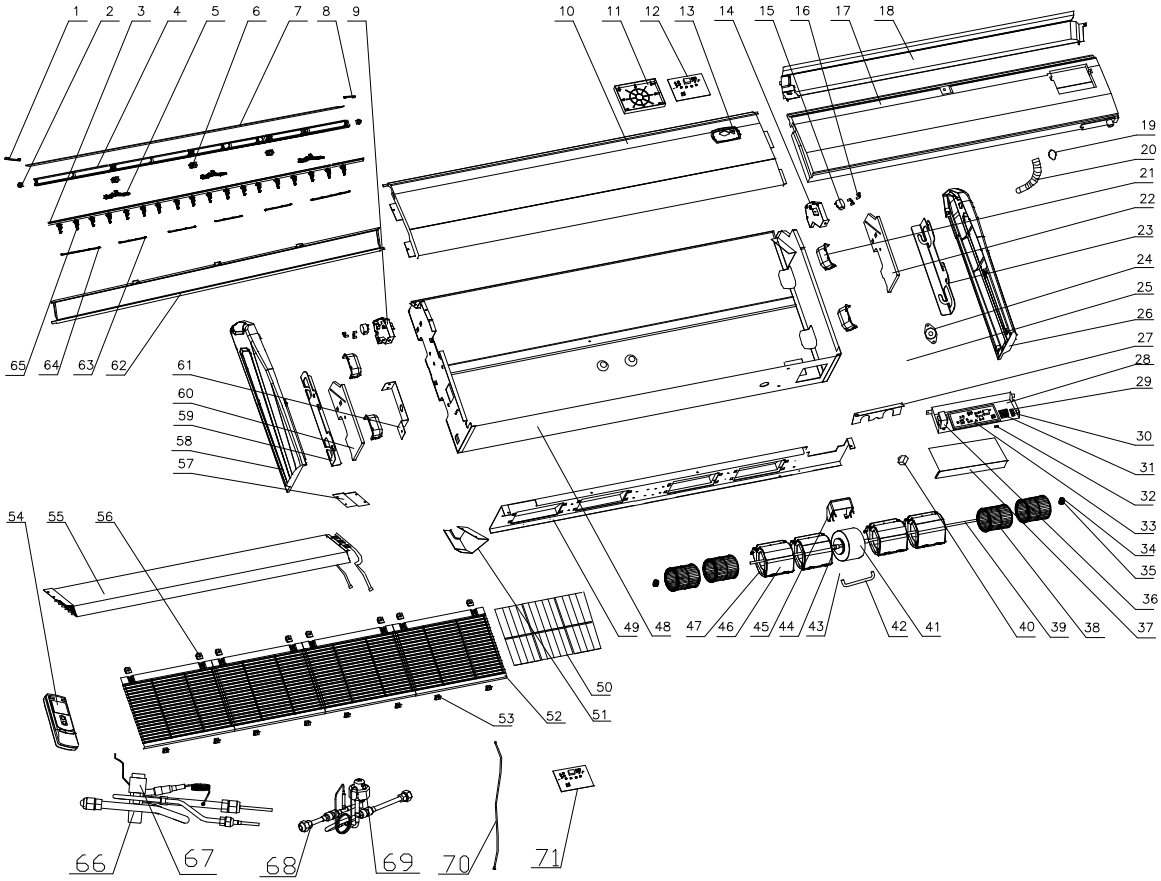


Parts List of GMV-Rh28Zd/Na-K, GMV-Rh36Zd /Na-K, GMV-Rh50Zd /Na-K:

No	Description	Qty	Part Code
			GMV-Rh28Zd/Na-K
	Exploded View	VRh28ZdNaK.BZ000000	
	Product Code	CM600N0100	
1	Rear Side Plate	1	01302013
2	Handle	4	26232001
3	Left Decoration Plate	1	261124152
4	Rear Side Plate of Air Outlet	1	0130201501
5	Louver	1	1051953202
6	Right Decoration Plate	1	261124162
7	Shaft of Louver II	2	10512026
8	Louver Support	2	24212019
9	Shaft of Louver I	1	10512025
10	Louver Fixer	1	24212018
11	Swing Louver	12	10512027
12	Connecting Lever	1	10582009
13	Connecting Lever	2	10582008
14	Right Swing Motor Fixer	1	26152006
15	Right Fixing Plate of Evaporator	1	01072411
16	Right Side Foam sub-assy	1	12312404
17	Right Fixing Plate	1	01332404
18	Right Decoration Panel	1	26112027
19	Pipe Clamp Plate	1	01072437
20	Capacitor 1uF/500V	1	33010089
21	Transformer 57X25C	1	43110237
22	Electric Box	1	01402407
23	Main PCB Z69251A	1	30224104
24	Terminal Board	1	42011159
25	Wire Base	1	24253001
26	Fuse 5A 250VAC	1	46010013
27	Cover of Electric Box	1	01412408
28	Pipe Clip	1	70812001
29	Drainage Pipe	1	05235433
30	Display Board 5T52	1	30545654
31	Electric Box	1	20102138
32	Front Grill Clip 1	4	26252002
33	Filter	2	11122013
34	Front Grill	2	22412010
35	Front Grill Clip 2	4	26252003

36	Front Panel	1	01544106
37	Front Panel	1	01532001P
38	Water Tray Panel	1	01272205P
39	Motor Support	1	01709532
40	Left Decoration Panel	1	26112028
41	Left Fixing Plate	1	01332405
42	Left Side Foam sub-assy	1	12312403
43	Left Fixing Plate of Evaporator	1	01072410
44	Motor Clamp	4	26112026
45	Step Motor MP35CA	2	15212402
46	Left Swing Motor Fixer	1	26152005
47	Evaporator Assy	1	01024134
48	Water Lead Panel	1	01362001
49	Cover of Evaporator	1	01072409
50	Fixed Mount	1	01708763
51	Centrifugal Fan	2	10312401
52	Rear Snail Shell	2	22202032
53	Front Snail Shell	2	22202031
54	Bar Clasp	4	70819522
55	Hoop	1	70819521
56	Motor PG10H	1	15707302
57	Remote Controller	1	305125063
58	Signal Cable	1	400103953
59	Display Board Z63351F	1	30296309
60	EXV sub-assy	1	07334319
61	Magnet Coil for EXV	1	430001087
62	4-way Valve Sub-Assy	1	04144163
63	4-way Valve Accessary	1	430004009

➢ Exploded View of GMV-Rh71Zd/Na-K:

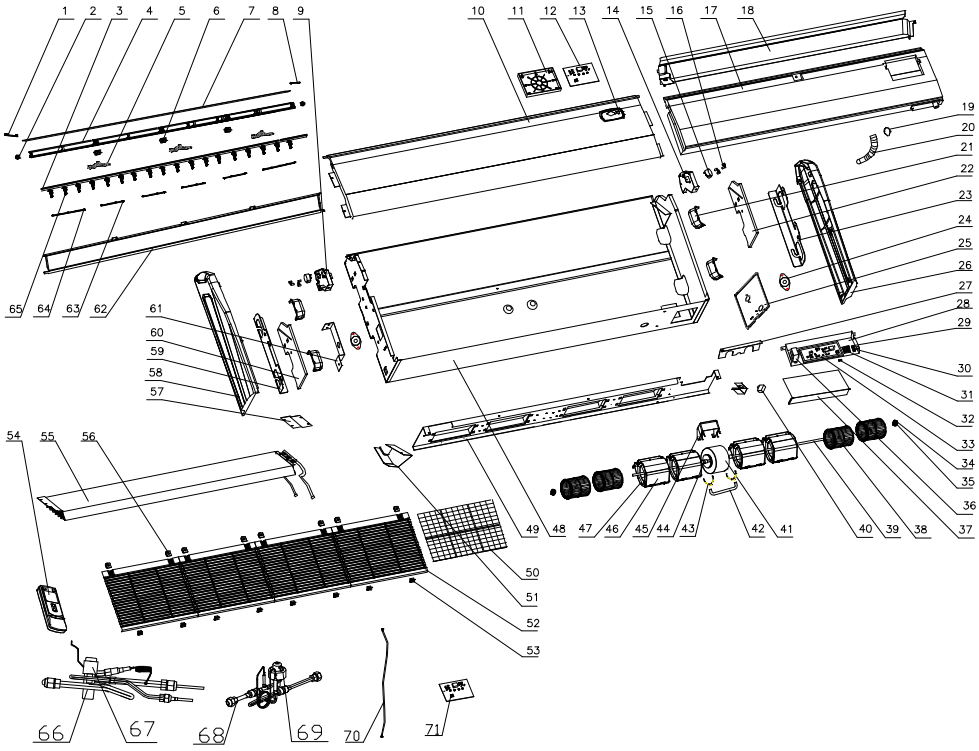


Parts List of: GMV-Rh71Zd/Na-K

No	Description	Qty	Part Code
			GMV-Rh71Zd/Na-K
	Exploded View	VRh71ZdNaK.BZ000000	
	Product Code	CM600N0130	
1	Left Decoration Plate	1	261124172
2	Shaft of Louver I	2	10512025
3	Swing Louver Fixer sub-assy	1	013324232
4	Louver Support	3	24212020
5	Louver Fixer	2	24222016
6	Louver	1	105124042
7	Shaft of Louver II	2	10512026
8	Right Decoration Plate	1	261124212
9	Left Swing Motor Fixer	1	26152007
10	Front Panel Sub-Assy	1	01532414
11	Display Box	1	20102138
12	Display Board 5T52	1	30545654
13	Front Panel	1	01544106
14	Right Swing Motor Fixer	1	26152008
15	Step Motor MP35CA	2	15212402
16	Motor Clamp	4	26112026
17	Water Tray	1	01272412
18	Auxiliary Water Tray	1	01272413
19	Pipe Clip	1	70812001
20	Drainage Pipe	1	05235433
21	Handle	4	26232001
22	Right Side Foam sub-assy	1	12312407
23	Right Fixing Palte	1	01332404
24	Support of Motor Bearing	2	01792408
25	Fixer of Motor Support	1	01792409
26	Right Decoration Panel	1	26112033
27	Pipe Clamp	1	01072424
28	Electric Box	1	01402407
29	Wire Base	1	24253001
30	Wire Clamp	1	24253002
31	Terminal Board	1	42011159
32	Fuse 5A 250VAC	1	46010013
33	Main Board Z69251A	1	30224104
34	Ring of Bearing	2	76512404
35	Fan Bearing	2	76512210
36	Transformer 57X25C	1	43110237
37	Cover of Electric Box	1	01412408
38	Centrifugal Fan	4	10312401
39	Rotary Axis	2	73012401
40	Capacitor CBB61 3uF/450	1	33010027
41	Motor FN100A	1	15012406
42	Motor Fixer	1	01722409
43	Motor Clamp	4	01702405

44	Axes Connector	2	73012403
45	Motor Fixing Plate	1	01332426
46	Front Snail Shell	4	22202031
47	Rear Snail Shell	4	22202032
48	Rear Side Plate	1	01302429
49	Motor Support	1	01702410
50	Filter	2	11122012
51	Water Lead Plate	1	01362401
52	Front Grill	2	22412011
53	Front Grill Clip 2	4	26252003
54	Remote Controller	1	305125063
55	Evaporator Assy	1	01024123
56	Front Grill Clip 1	4	26252002
57	Cover of Evaporator	1	01072417
58	Left Decoration Panel	1	26112032
59	Left Fixing Plate	1	01332405
60	Left Side Foam sub-assy	1	12312406
61	Bearing Fixing Plate	1	01332407
62	Rear Side Plate of Air Outlet	1	01302405
63	Connecting Lever	3	10582008
64	Connecting Lever	2	10582009
65	Air Louver	22	10512028
66	4-way Valve Sub-Assy	1	04144156
67	4-way Valve Accessary	1	430004009
68	EXV sub-assy	1	07334315
69	Magnet Coil for EXV	1	430001087
70	Signal Cable	1	400103953
71	Display Board Z63351F	1	30296309

➢ Exploded View of GMV-Rh90Zd/Na-K, GMV-Rh112Zd/Na-K, GMV-Rh125Zd/Na-K:



Parts List of GMV-Rh90Zd/Na-K, GMV-Rh112Zd/Na-K, GMV-Rh125Zd/Na-K:

No	Description	Qty	Part Code
			GMV-Rh90Zd/Na-K
	Exploded View	VRh90ZdNaK.BZ000000	
	Product Code	CM600N0090	
1	Left Decoration Plate	1	261124152
2	Shaft of Louver I	3	10512025
3	Swing Louver Fixer sub-assy	1	0133241802
4	Louver Support	4	24212019
5	Louver Fixer	3	24212018
6	Shaft of Louver II	2	10512026
7	Louver	1	105124082
8	Right Decoration Plate	1	261124162
9	Left Swing Motor Fixer	1	26152005
10	Front Panel	1	01532413
11	Display Box	1	20102138
12	Display Board 5T52	1	30545654
13	Front Panel	1	01544106
14	Right Swing Motor Fixer	1	26152006
15	Step Motor MP35CA	2	15212402
16	Motor Clamp	4	26112026
17	Water Tray Sub-Assy	1	0127240802
18	Auxiliary Water Tray	1	01272409
19	Pipe Clip	1	70812001
20	Drainage Pipe	1	05235433
21	Handle	4	26232001
22	Right Side Foam sub-assy	1	12312404
23	Right Fixing Palte	1	01332404
24	Support of Motor Bearing	2	01792408
25	Fixer of Motor Support	1	01792407
26	Right Decoration Panel	1	26112027
27	Pipe Clamp	1	01072425
28	Electric Box	1	01402407
29	Wire Base	1	24253001
30	Wire Clamp	1	24253002
31	Terminal Board	1	42011159
32	Fuse 5A 250VAC	1	46010013
33	Main PCB Z69251A	1	30224104
34	Ring of Bearing	2	76512404
35	Fan Bearing	1	76512210
36	Transformer 57×25C	1	43110237
37	Cover of Electric Box	1	01412408
38	Centrifugal Fan	4	10319051
39	Rotary Axis	2	73012402
40	Capacitor CBB61 5uF/450	1	33010064
41	Motor FN150A	1	15012405
42	Motor Fixer	1	01722410
43	Motor Clamp	4	01702405

44	Axes Connector	2	73012403
45	Motor Fixing Plate	1	01332425
46	Front Snail Shell	4	22202030
47	Rear Snail Shell	4	22202029
48	Rear Side Plate	1	01302431
49	Motor Support	1	01702411
50	Filter	1	11122013
51	Water Lead Plate	1	01362407
52	Front Grill	4	22412010
53	Front Grill Clip 2	8	26252003
54	Remote Controller	1	305125063
55	Evaporator Assy	1	01024122
56	Front Grill Clip 1	8	26252002
57	Cover of Evaporator	1	01072409
58	Left Decoration Panel	1	26112028
59	Left Fixing Plate	1	01332405
60	Left Side Foam sub-assy	1	12312403
61	Bearing Fixing Plate	1	01332406
62	Rear Side Plate of Air Outlet	1	01302416
63	Connecting Lever	2	10582008
64	Connecting Lever	4	10582009
65	Swing Louver	26	10512027
66	4-way Valve Sub-Assy	1	04144156
67	4-way Valve Accessary	1	430004009
68	EXV sub-assy	1	07334314
69	Magnet Coil for EXV	1	43000110
70	Signal Cable	1	400103953
71	Display Board Z63351F	1	30296309